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Does the International Baccalaureate Diploma Programme have potential to enhance the self-regulated learning of high-achieving students and students with learning difficulties?

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King's College, London

School of Education, Communication, and Society

Doctorate in Education

Research Based Thesis

Sandra Elizabeth Forrest

**Does the International Baccalaureate Diploma Programme
have potential to enhance the self-regulated learning of
high-achieving students and students with learning difficulties?**

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Abstract

This investigation set out to explore how high-achieving IB Diploma Programme students and those with learning difficulties develop self-regulated learning (SRL) in a context in which teachers are learning to be more student-centred and teach Approaches to Learning (ATL) skills. Particular foci were the strategies students in each group implemented, their perspectives with regard to ‘good teaching,’ and the degree to which they regarded explicit instruction of ATL skills important. A situated model of SRL was the ‘umbrella’ theoretical perspective underpinning this investigation, to which social cognitive and information processing theories contributed valuable insights.

The first phase of the investigation utilised a qualitative multiple case study design. The cases were four IBDP students with diagnosed learning difficulties and six high-achieving IBDP students. Methods included collecting samples of independent work that reflected participants’ approaches to learning in the IBDP; accompanying written reflections; semi-structured interviews utilising a combination of stimulated recall and open-ended questions; and four years of school report teacher comments to mitigate limitations of self-report data and illuminate the development of participants’ SRL over time. The second phase of this investigation involved focus groups guided by open-ended questions aimed at exploring the extent to which participants believed it was important for their teachers to teach them ATL skills.

The results of this investigation suggest that the constructivist epistemology and student-centred, process-focused pedagogical approach espoused by the IB are well-aligned with what empirical evidence suggests is SRL-promoting practice. Although the IB Diploma Programme is widely considered an appropriate secondary programme for high-achieving students, the DP’s potential to enhance SRL suggests this programme may also be an appropriate option for some university-bound students with learning difficulties. As the literature review for this investigation uncovered only one previous study pertaining to IB Diploma Programme students with learning difficulties, this is a significant contribution to knowledge with implications for admissions as well as teaching and learning in IB schools. This investigation also indicates that epistemic awareness may play a more significant role in SRL than contemporary theories suggest and, further, that adopting a criteria-driven ‘mastery by performance’ goal orientation may be more beneficial to SRL in some contexts than a ‘mastery’ orientation motivated by intrinsic interest in learning. These contributions represent new directions for researchers who wish to investigate SRL in real educational settings.

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Chapter 1: Introduction

This investigation was conducted in a small, non-selective, all-girls international school located in the UK. Offering both the International Baccalaureate Middle Years Programme (IBMYP) and Diploma Programme (IBDP), the school had introduced the DP to its secondary school students in 1979. However, at the time of this investigation it was still grappling with balancing the constructivist, student-centred pedagogical approach the IB expects of IB World Schools (IB 2014b; IB, 2009) with the pressures that typically accompany the delivery of the Diploma Programme (Hallinger *et al*, 2011; Shaunessy and Suldo, 2010; Taylor and Porath, 2006).

As Director of Specialist Programmes, I was responsible for facilitating the development of teaching and learning at this school in line with IB expectations. This remit included the development and coordination of three programmes in particular: the Approaches to Learning (ATL) continuing professional development (CPD) programme, which aimed to develop teaching and learning to be more student-centred and include explicit instruction of ATL skills; the Learning Resources Centre (LRC) programme, which was designed to help students with diagnosed learning difficulties believe in their capability and take ownership of their own learning; and the Enrichment Programme (EP), which provided the school's highest achievers with additional challenge to capture their interest, limit 'coasting,' and enhance self-regulated learning (SRL) as needed.

Tying these programmes together was an agenda underpinned by several assumptions: 1) how students learn depends on how they are taught; 2) success in the DP depends on how students approach their learning, and; 3) in the context of student-centred teaching, students of all abilities can successfully access the DP curriculum. This agenda was recursively related to a professional interest in self-regulated learning (SRL). SRL is defined as individual learners '*taking control of cognitive, behavioural,*

motivational, and emotional conditions/states through iterative processes of planning, monitoring, evaluation and change' (Hadwin *et al*, 2018, p. 83).

While many people view the IB Diploma Programme as suitable for elite, high-achieving students and unsuitable for students with learning difficulties (Siskin *et al*, 2010), in my experience academic potential is a highly complex concept thus the question of for whom the DP is suitable is not straightforward. In 15 years as a teacher in IB schools, students have surprised me over and over again. Those who should achieve highly in the DP, based on their perceived high ability, often do not. Students with learning difficulties who are not expected to succeed in the DP often do. I have increasingly come to believe that how students approach their learning, in other words the effectiveness of their SRL, ultimately determines whether students flourish or flounder in the DP. What I did not fully understand as this investigation commenced was how SRL develops in different students, what it 'looks like' in terms of their own independent learning, and how we, as a school, undermine or enhance this development within students of varying abilities and backgrounds. I now turn to a brief discussion of the IB Diploma Programme, self-regulated learning, the conceptualisation of the research problem and the theoretical perspectives underpinning this investigation.

The International Baccalaureate Diploma Programme is one of the most rigorous secondary school programmes available, preparing students well for the demands of university study (Culross and Tarver, 2011). The programme is so rigorous it has been referred to as the 'Cadillac of College Prep' (Culross and Tarver, 2011, p. 232) and its graduates can be offered university credit based on their DP grades (Conley *et al*, 2014; Poelzer and Feldhusen, 1997; Tookey, 1999; IB, 2016). DP students take three subjects at Higher Level (HL) and three subjects at Standard Level (SL) in six different subject groups (IB, 2009). They also complete the core components of Theory of Knowledge (TOK), a philosophical course designed to stimulate critical thinking (Culross and Tarver, 2011), the Extended Essay (EE), a 4,000 word research paper

designed to ‘promote high-level research and writing skills, intellectual discovery and creativity’ (IB, 2008, p. 20), and the Creativity, Action, and Service (CAS) programme. CAS involves students in extra-curricular activities intended to enhance personal and interpersonal development (IB, 2016) and prepare students with the attributes that are ‘essential for success in future academic pursuits and for adult life’ (IB, 2014a, p. 22).

Although the DP is renowned for academic rigour, it was developed with the idea that a ‘traditional’ approach to education will not adequately prepare students for learning within a rapidly changing 21st century world (IB, 2009). Hence, alongside rigorous, content-heavy syllabi, the DP curriculum emphasises the intellectual, personal, and social growth of the whole person and encourages students to become ‘active, compassionate, and lifelong learners who understand that other people, with their differences, can also be right’ (IB, 2014b, p. i). The concept of ‘lifelong learning,’ in particular, has been linked to SRL (Dignath and Büttner, 2008; Winne, 1997; Butler *et al*, 2017; Zimmerman, 2002). Because learning and acting are ‘interestingly indistinct’ (Brown *et al*, 1989, p. 33), lifelong learning results from continuous *active* engagement in learning. As self-regulating learners purposefully generate actions, emotions, and thoughts in order to direct their own learning (Schunk and Zimmerman, 2007), the skills, attitudes, and behaviours involved in self-regulated learning are also those that inspire and enable people to learn throughout their lives (Butler *et al*, 2017).

SRL researchers from across theoretical perspectives agree that it is ‘student-centred’ instructional practices that facilitate self-regulated learning (Butler and Schnellert, 2015; Schunk, 2005; Heikkilä and Lonka, 2006; Ross *et al*, 2003; Meyer and Turner, 2002; Patrick and Middleton, 2002; Boekaerts and Cascallar, 2006). Although the IB rarely refers to SRL in its texts, within the Diploma Programme ‘teaching and learning,’ used a single concept because the IB considers these processes interdependent (IB, 2014b), is meant to be student-centred. Teaching that ‘transmits’ information to ‘passive recipients’ (IB, 2009, p. 37) is discouraged, and DP teachers are expected to

explicitly teach ATL skills in order to develop students' capacity to take ownership of their learning (IB, 2008; IB 2016). In recent DP curriculum updates, ATL has increasingly been emphasised (IB, 2015).

Furthermore, in addition to detailing how conceptual understanding and rigorous content knowledge will be developed, the DP's prescribed syllabi encourage connections between the curriculum, the real world, and students' own beliefs, actions, and behaviours (IB, 2008). An emphasis on 'reflection, insight and personal evaluation' (Tookey, 1999, p. 55) indicates further alignment between the values and philosophy underpinning a DP education and the processes involved in self-regulated learning. Indeed, the IB specifies that learning how to learn, an aim of teaching and learning in the DP (IB, 2009; IB, 2015), requires that students 'realistically evaluate and self-regulate their performance' (IB, 2014b, p. 14). Nonetheless, while Wright's (2015) life history research demonstrates that the capacity for self-directed learning is perceived by DP graduates as an enduring benefit of the programme, many students struggle to regulate their learning while still enrolled in the DP (Culross and Tarver, 2011; Taylor and Porath, 2006).

With this in mind, and in response to an IB (2011) accreditation recommendation that teachers implement a wider range of student-centred activities to facilitate students' ownership of their own learning, the school involved in the current investigation had previously undertaken a three-year CPD programme which, as Director of Specialist Programmes, I had developed to help transform the school's culture from traditional to student-centred and facilitate explicit instruction of ATL skills. For my Institution Focused Study (IFS) (Forrest, 2017; Forrest, 2018), I formatively assessed the three CPD opportunities that comprised the second year of this programme in order to gain on-going insights into the extent to which the CPD developed teachers' knowledge, beliefs, attitudes, values, and practice and which aspects of CPD they found most helpful. To ascertain whether it had met its aim of transforming

the school's culture from traditional to student-centred, I also summatively evaluated the programme. I found that, while CPD significantly influenced instructional practice in the MYP, teaching in the DP was more intransigent. DP teaching and learning had become more 'process-focused' in relation to assessed coursework and performance tasks, but teaching and learning of content remained, for the most part, highly traditional, with many teachers still 'transmitting' content and students 'receiving' it.

In line with research evidence (Hallinger *et al*, 2011; Li, 2012), these teachers maintained the conviction that, given the rigorous curriculum, they could not afford to sacrifice instructional time needed to teach content by implementing student-centred, process-focused methods and teaching ATL skills (Forrest, 2017). Furthermore, they firmly believed that their students would resist any such pedagogical change. Nevertheless, it was not uncommon for DP students, particularly those in Grade 12, to struggle with SRL-related issues and underperformance relative to their perceived capabilities, particularly in certain content-heavy subjects, raising questions that were not addressed by my IFS.

For example, in a context such as this, in which teachers are learning to adopt a more student-centred approach but believe a 'teacher-focused' approach is better suited to DP teaching and learning, how do IB Diploma Programme students develop SRL? Do they think being taught ATL skills is important enough to sacrifice instructional time that could otherwise be spent on content? Furthermore, who, from the perspective of the students themselves, is 'right' about the loaded notion of 'good teaching' in the IBDP? Is it the International Baccalaureate, who developed the programme? Or are DP teachers who are 'in the trenches' and have day-to-day first-hand experience working with DP students more attuned to students' perspectives?

Despite my own strongly held beliefs regarding the SRL-enhancing potential of student-centred teaching and explicit instruction of ATL skills, having carefully searched the research literature I could find no explicit empirical link between the ATL

component of the IB curriculum continuum and self-regulated learning. As the number of IB schools increased by 39% between 2012 and 2017 alone, reaching 5,000 in 153 countries in 2019 (IB, 2019), this is not an insignificant gap in the literature. Moreover, there were no references to any contemporary SRL theories in any of the IB texts reviewed for this investigation, suggesting that Wells' (2011) argument that the theoretical underpinnings of the IB Learner Profile are unclear may equally apply to Approaches to Learning. Given the rapid expansion of IB schools (Siskin *et al*, 2010; Hallinger *et al*, 2011; IB, 2019), the increasing prominence of similar curriculum objectives (Wolters, 2010; Mannion and Mercer, 2016; James *et al*, 2006; Black *et al*, 2006) and the limited guidance available to teachers who wish to promote self-regulated learning in their students (Dignath and Büttner, 2008), this investigation presented an opportunity to address such gaps in the literature while also attempting to understand the potential role of ATL in the development of DP students' self-regulated learning in this context.

Finally, as suggested by Winne (1995), 'understanding how learners develop and use SRL when they study alone may uncover principles for designing better resources... [and] may provide clearer guidance about how to engineer the scaffolds for supporting the development of SRL in social contexts' (p. 174). Although the suitability of the DP as an effective college preparatory programme for high-achieving students is well-established (Conley *et al*, 2014; Culross and Tarver, 2011; Poelzer and Feldhusen, 1997; Tookey, 1999), this literature review uncovered only one study (see Siskin *et al*, 2010) pertaining to IBDP students with learning difficulties. My close involvement with high-achieving students and those with learning difficulties at this school therefore raised additional questions about Diploma Programme teaching and learning. How do students in each of these groups develop SRL in a context such as this, and do the strategies IBDP students with learning difficulties use during independent study differ from those high-achieving students use? If so, what accounts for these differences?

An EdD differs from a PhD in that it is meant to make a meaningful contribution to professional practice as well as contribute knowledge to a particular field. Given links between SRL and success in life (Dignath and Büttner, 2008; Klassen, 2010; Ruban *et al*, 2003; Firth *et al*, 2008), as a doctoral student, I hoped this investigation could address aforementioned gaps in the literature. However, as Director of Specialist Programmes it was important for me to understand whether and how teaching and learning in in this context enhanced the self-regulated learning of participants so I could determine how to develop the SRL-promoting capacity of the school's ATL, LRC and Enrichment programmes and potentially help enhance the overall experience of DP students at this school.

Social cognitive theory, investigating SRL from a 'goal-oriented' perspective, and information processing theory, investigating SRL from a 'metacognitively-focused' perspective (Muis, 2007, p.175), have guided much of the SRL research to date. However, Schunk and Greene (2018) argue that research findings over the past four decades have given rise 'to the perceived need for integrated perspectives on self-regulation' (p. 3). Moreover, Butler and Cartier (2018) point out that contemporary researchers need frameworks for studying SRL as complex, dynamic, iterative, multi-componential individual-context interactions that intentionally and adaptively unfold over time.

With this in mind, in the current study self-regulated learning was investigated naturalistically and from an integrated theoretical lens. A *situated model* served as the 'umbrella' perspective illuminating individual-context interactions, while *social cognitive* and *information processing theories* further illuminated what students brought to their learning and how their self-regulatory processes unfolded. While there is a precedent for integrating different theoretical perspectives relevant to understanding and promoting the development of SRL (Anyichie and Butler, 2017; Butler, 2002a; Ross *et al*, 2003; Butler and Winne, 1995; Järvenoja *et al*, 2015; Häikkilä and Lonka, 2006;

Hadwin, 2013; Pintrich, 2003; Black and Wiliam, 2009), a careful review of the literature revealed no other empirical studies that investigate SRL ‘naturalistically’ through integrating social cognitive, information processing, and situated lenses.

This investigation set out to explore the question:

How, in an IB Diploma Programme in which teachers are learning to be more student-centred and explicitly teach ATL skills, does the self-regulated learning of high-achieving students and those with learning difficulties evolve?

Four sub-questions ultimately guided this study:

1. In this context, how do high-achieving IB Diploma Programme students and those with diagnosed learning difficulties develop self-regulated learning?
2. In this context, do the strategies that high-achieving IBDP students use to regulate their learning differ from those students with learning difficulties use? If so, how do they differ and what accounts for these differences?
3. In this context, what teaching approaches do high-achieving IBDP students and those with learning difficulties consider to be ‘good teaching’? How do these relate to SRL-promoting teaching approaches identified in the literature and espoused by the IB?
4. In this context, how important do high-achieving IBDP students and those with learning difficulties think it is for teachers to teach them Approaches to Learning skills?

This report commences with a review of the literature that discusses 1) the three contemporary perspectives of self-regulated learning underpinning this investigation; 2) how self-regulated learning relates to learning difficulties and high achievement from an integrated theoretical perspective; 3) SRL-promoting instructional environments, including SRL-promoting teaching practices, 4) aspects of the IB Diploma Programme

that have the potential to enhance self-regulated learning in students, and; 5) why SRL may be difficult to achieve while students are still enrolled in the programme.

Chapter 2: Literature Review

This chapter is structured into five sub-sections. I first provide a brief overview of convergences between three contemporary perspectives of self-regulated learning: social cognitive theory, information processing theory, and a situated model of SRL. I then discuss the aspects of social cognitive and information processing theories most relevant to this investigation and analyse, from a situated model of SRL, what students with learning difficulties and high achievers bring to their learning. Importantly, social cognitive and information processing theories contribute valuable insights to this part of the discussion, highlighting the benefits of an ‘integrated’ theoretical perspective. After presenting the theoretical perspectives that informed this investigation, I discuss SRL-promoting instructional environments with an emphasis on three ‘student-centred’ teaching approaches: collaborative learning, process-focused instruction, and formative assessment. This chapter concludes with a discussion of the IB Diploma Programme’s potential to enhance self-regulated learning and why this potential is not universally realised.

2.1 Understanding self-regulated learning in academic settings

Over the past four decades, a plethora of theoretical lenses have been applied to the study of self-regulated learning in academic settings (Butler and Cartier, 2018). Particularly prevalent amongst these are social cognitive theory (Zimmerman, 2002), information processing theory (Winne and Hadwin, 1998), and a situated model of SRL (Butler and Cartier, 2018). These theories are highly compatible, with a great deal of

overlap between them (Schunk and Greene, 2018; Wolters, 2010; Heikkilä and Lonka, 2006).

Important convergences between these perspectives include constructivist underpinnings (Anyichie and Butler, 2015); a view that the relationship between personal, environmental, and behavioural aspects of SRL is reciprocal (Usher and Schunk, 2018; Winne, 2018; Butler and Cartier, 2018) and; a recognition that cognition, metacognition, emotion, motivation, and goal-setting all play a role in SRL (Schunk and Greene, 2018). Moreover, from each perspective SRL is described as occurring in recursive, dynamic, cyclical phases that include analysing the task and drawing on personal resources, setting goals and selecting strategies to meet them, applying strategies and reflectively monitoring progress, and evaluating outcomes (Zimmerman, 2002; Winne and Hadwin, 1998; Butler and Cartier, 2018). Each perspective also views SRL as a developmental process that can be enhanced in SRL-promoting environments (Zimmerman, 1990; McCabe, 2011; Butler *et al*, 2011; Winne, 2018). Finally, each perspective considers failing to draw upon a supportive environment a reflection of poor SRL (Ross *et al*, 2003; Azvedo *et al*, 2008; Zimmerman, 1999).

Together the various theoretical perspectives provide a comprehensive picture of the complexity of self-regulated learning and how it develops (Ross *et al*, 2003; Järvenoja *et al*, 2015). A social cognitive perspective clarifies this by foregrounding how the self-efficacy and motivation students bring with them contribute to their inclination to regulate their own learning. This perspective also suggests that SRL is not an absolute, but a matter of degree (Zimmerman, 1989), and highlights the role of reflection in the effectiveness of SRL. An information processing perspective, on the other hand, foregrounds the role of students' metacognitive, cognitive (Winne, 2018), and epistemic awareness (Pieschl *et al*, 2014) in the development and effectiveness of their SRL. A situated model draws these perspectives together by suggesting that 'what the student brings' involves a wide array of strengths, challenges, previous work habits, knowledge,

skills, appraisals, beliefs, values and understandings that interact in varying ways with the contexts in which students live and learn (Butler and Cartier, 2018). A situated model thus views self-efficacy, motivation, cognition, metacognition and behaviour as situated in context and therefore ‘continually shifting in response to personal and social dynamics (Kaplan *et al*, 2011, p. 291).

In the next part of this chapter, I discuss the aspects of social cognitive and information processing theories most relevant to this investigation. In relation to social cognitive theory, I discuss self-efficacy, motivation, reflection, and the developmental levels that learners pass through as they increase their self-regulatory effectiveness. In relation to information processing theory, I discuss metacognitive, cognitive, and epistemic awareness. I then draw upon a situated model to analyse ‘what the student brings’ in relation to the SRL of students with learning difficulties and high-achievers. In doing so, I suggest that the processes emphasised by social cognitive and information processing theories can be incorporated into a wider view of what students with learning difficulties and a history of high achievement bring to their learning. This argument underscores the complexity of influences that set SRL in motion, the strategies students use to regulate their learning, and the development of self-regulatory effectiveness over time.

2.2 Understanding SRL from a social cognitive perspective

Forethought phase: The crucial role of self-efficacy and motivation in igniting SRL

From a social cognitive perspective, ‘forethought’ is the first phase of SRL (Zimmerman, 2002). In this phase, students analyse the task, draw on their self-efficacy beliefs, set goals, begin planning, and motivate themselves to take a strategic approach.

Importantly, ‘self-efficacy’ beliefs are not presumed to be dispositional. Rather, they are multidimensional, reflecting students’ beliefs regarding their ability to succeed on a particular task in a given domain (Zimmerman, 2000). Self-efficacy is therefore an important influence on task-specific motivation, influencing the goals students set and effort they are willing to exert (Zimmerman, 2000; Cleary and Zimmerman, 2004). Self-efficacy sets SRL in motion, impacting students’ propensity to engage in subsequent phases of strategy selection, implementation, and monitoring (Cleary and Zimmerman, 2004).

Furthermore, because from a social cognitive perspective all phases of SRL are understood to be dynamic and recursive (Zimmerman, 2002), the relationship between self-efficacy and SRL is considered to be reciprocal (Cleary and Zimmerman, 2004). In other words, high levels of self-efficacy should lead to higher levels of SRL, and high levels of SRL will, in turn, increase self-efficacy. With this in mind, students with high levels of self-efficacy tend to participate in class more readily, exert more effort, and persist for longer in the face of challenge (Zimmerman, 2000). Students with lower levels of self-efficacy, on the other hand, may engage in self-handicapping behaviours such as failing to prepare for tests and not paying attention in class (Cleary and Zimmerman, 2004).

However, from a social cognitive perspective, self-efficacy is not the only influence on motivation and SRL. Achievement goal theory, identifying how students’ goal orientations influence their approach, has also informed how social cognitive researchers understand the forethought phase of SRL (Usher and Schunk, 2018). Achievement goals are divided into two main orientations: mastery and performance (Pintrich, 2003; Sideridis, 2006; Kaplan *et al*, 2011). Whereas ‘mastery’ goals generally focus on intrinsic motivators, such as a genuine interest in learning, performance goals focus on extrinsic motivators, such as grades. These categories have been further divided into ‘approach’ and ‘avoidance’ orientations. Whereas ‘approach’ orientations focus on

achieving success, ‘avoidance’ orientations focus on avoiding failure (Pintrich, 2003). Thus, a mastery approach orientation is characterised by self-set goals focused on mastering knowledge, skills, and processes; a mastery avoidance orientation is characterised by concerns about not learning; a performance approach orientation is characterised by wanting to achieve good grades or outperform others; and a performance avoidance orientation is characterised by not wanting to achieve poor grades or to underperform in relation to others.

Because motivation in the forethought phase of SRL refers to *self*-motivation, stemming from intrinsic interest (Zimmerman, 2002), a mastery approach goal orientation is generally associated with high levels of self-efficacy and enhanced SRL (Zimmerman, 2002; Pintrich, 2003; Usher and Schunk, 2018). However, the impact of a ‘performance’ approach orientation on SRL is less straightforward. A performance approach orientation has sometimes been found to stimulate SRL and lead to better attainment than a mastery approach orientation (Sideridis, 2006), but focusing on grades in the absence of interest has also been found to lead to task completion goals, undermining SRL and quality of performance (Lichtinger and Kaplan, 2015). Given discrepant findings such as these, it is possible that it is the ‘approach’ aspect to goal orientation that is most advantageous, and that dichotomising mastery and performance goals does not necessarily reflect how effective learners motivate themselves in real situations (Pintrich, 2003; Sideridis, 2006).

In fact, adopting multiple goals, either simultaneously or at different times, might actually be more advantageous than maintaining a strong orientation towards either mastery or performance goals (Pintrich, 2003; Zimmerman, 1999; Sideridis, 2006). A ‘multiplicative’ goal orientation (Sideridis, 2006, p. 13) can have an additive effect, with both types of goals having independent positive effects; an interactive effect, with both types of goals having interdependent positive effects, or; a selective effect, with a single goal type having a positive effect for a particular situation (Pintrich, 2003).

Sideridis (2006) refers to a multiplicative goal orientation whereby students aim for mastery by focusing on criteria as a ‘mastery by performance’ (p. 13) goal orientation. Because such an orientation capitalises on standards as ‘roadmaps’ for learning and performance, it may lead to more effective SRL (White and DiBenedetto, 2018) than a strong mastery approach orientation.

Performance phase: Implementing strategies and observing progress

From a social cognitive perspective, once students have drawn upon their self-efficacy beliefs, established their goals, and planned their approach, they enter the ‘performance’ phase of SRL (Zimmerman, 2002). During this phase students implement their planned strategies and observe their progress towards their goals. It is important to note, though, that although Zimmerman and Martinez-Pons (1986) identified fourteen types of strategies that students engage in to regulate their learning, simply using these strategies does not indicate that a student is engaging in the performance phase of SRL. Zimmerman (1990) defines SRL strategies as ‘*actions and processes directed at acquisition of information of skills that involve agency, purpose, and instrumentality perceptions by learners*’ (p. 5). Thus, strategies can only be considered ‘self-regulated learning strategies’ if underpinned by self-efficacy beliefs, purposefully directed at acquiring skills and information, and monitored for effectiveness. In short, it is the sense of agency, purpose, and instrumentality underpinning strategy implementation, not the strategies themselves, that determines whether their use reflects SRL.

Self-reflection phase: Evaluating one's own performance

The final phase of SRL from a social cognitive perspective is self-reflection (Zimmerman, 2002). In this phase, students actively compare their performance with a standard by which a comparison can be made. This can involve evaluating one's own performance against someone else's, a mark scheme (Zimmerman, 1989), or performance standards or criteria (White and DiBenedetto, 2018). To be effective at self-reflection, students must be able to both judge the quality of their own work against the standard and generate accurate attributions for their performance (Cleary and Zimmerman, 2004; Zimmerman, 1990). Furthermore, without reflecting on how performance is linked to strategy use, students will not be able to increase their effectiveness or enhance their performance in the next learning situation (Cleary and Platten, 2013).

Developmental levels of SRL competence

From a social cognitive perspective, self-regulatory competence is considered a matter of degree, not an absolute (Zimmerman, 1989), and is presumed to be explicitly 'teachable' (Zimmerman, 2002). As students develop SRL they pass through four levels of competence: observation, emulation, self-control, and self-regulation (Schunk and Zimmerman, 2007; Usher and Schunk, 2018; White and DiBenedetto, 2018). At the 'observation' level, students observe while someone else models a new skill or strategy. At the 'emulation' level, students practice new skills and strategies with the support of external feedback and guidance. At the 'self-control' level, students internalise the new skill or strategy, using it in the way it was modelled but with increasing levels of independence. Finally, students who have achieved the 'self-regulation' level have taken

ownership of the new skill or strategy and are able to flexibly adapt it as needed and accurately self-evaluate their performance.

2.3 Understanding SRL from an information processing perspective

Whereas social cognitive theory foregrounds the impact of self-efficacy, motivation and reflection on SRL, information processing theory illuminates how the quality of students' *thinking* impacts SRL. Thus, this theory adds another dimension to an understanding of what students 'bring' to their learning. In this section I provide an overview of three aspects of information processing theory that help to determine the effectiveness of students' self-regulated learning: metacognitive, cognitive, and epistemic awareness.

Metacognitive awareness

Information processing theory was conceived with a view of 'studying' as 'metacognitively powered self-regulated learning' (Winne and Hadwin, 1998, p. 299). 'Metacognition,' defined as '*knowledge and cognition about cognitive phenomena*' (Flavell, 1979, p. 906), is a complex construct encompassing metacognitive knowledge, experiences, goals, and strategies. According to Flavell, metacognitive knowledge refers to knowledge about oneself, tasks, and metacognitive strategies. Metacognitive experiences refer to conscious or affective experiences that accompany learning, for example a sense of confusion or satisfaction. Metacognitive strategies refer to strategies that enable students to monitor their own learning.

These metacognitive processes are extremely complex, though, and many learners do not possess empirically-based strategies for monitoring learning or purposefully engage their metacognition (Bjork *et al*, 2013). In fact, students' judgements regarding their own learning often reflect biases, or 'metacognitive illusions' (McCabe, 2011, p. 463), that undermine SRL by convincing people they have learned when they have not. Strategies associated with metacognitive illusions make short-term learning easier but do not promote development of rigorous content knowledge, conceptual understanding, sophisticated task-appropriate skills and long-term retention (McCabe, 2011; Bjork *et al*, 2013). Strategies such rereading the textbook, cramming, 'blocking' study topics, always studying in the same place, over-relying on a single strategy, and being distracted by interesting but irrelevant details are all associated with metacognitive illusions. While these strategies may work for memorising and for learning 'rote' content, they are less effective for more complex learning (McCabe, 2011; Winne, 2018).

With this in mind, metacognitive awareness involves a recognition that developing complex knowledge and skills is difficult (Bjork *et al*, 2013). Thus, when learning complex content and developing task-appropriate skills, students with sophisticated metacognitive awareness use strategies that create 'desirable difficulties' to avoid metacognitive illusions (Bjork and Bjork, 2011; Bjork *et al*, 2013). Creating 'desirable difficulties' makes learning more difficult while students are engaged in learning activities, but ultimately enhances complex learning and promotes long-term retention (Bjork *et al*, 2013). Strategies for creating desirable difficulties include varying conditions of practice, spacing study sessions, interleaving study topics, generating one's own notes, and practicing retrieval and self-testing (Bjork and Bjork, 2011; Bjork *et al*, 2013).

Cognitive awareness

While metacognitive awareness and strategies are engaged to help self-regulating learners *monitor* their progress, cognitive awareness and strategies are engaged in order to *make* cognitive progress (Flavell, 1979). Winne and Hadwin's (1998) COPES model represents the cognitive processes self-regulating learners engage in to do this. First, they analyse the Conditions of the task. After this, they perform Operations (strategies). Students then create Products and Evaluate outcomes through the use of Standards. Illuminating the complexity of these processes, embedded within the COPES model (and representing the Q in this model) are Winne's (2018) 'SMART' cognitive strategies (p. 37). These include Searching (directing cognitive attention to information that meets standards); Monitoring (identifying the degree to which information meets standards); Assembling (identifying relationships between discrete bits of information); Rehearsing (taking steps to remember information); and Translating (transforming information into a new format).

Furthermore, from an information processing perspective, tasks, not social models, are the typical instructional unit, (Hoyle and Dent, 2018). Self-regulated learners are understood to flexibly adapt their approach to the demands of a particular task, including its complexity (Pieschl *et al*, 2012; Pieschl *et al*, 2014). 'Simple' tasks focus the learner on memorising 'surface' aspects of a particular concept or topic, leading to 'shallow processing' (Dinsmore and Alexander, 2012; Baeten *et al*, 2010). Shallow processing involves rote or 'surface' strategies (such as rereading the textbook or rehearsing flashcards) that emphasise memorisation (Gibbs and Coffey, 2004; Felder and Brent, 2005; Heikkilä and Lonka, 2006; Kember *et al*, 2004; Kember, 2001; Baeten *et al*, 2010). Although potentially beneficial for simple tasks and therefore not inherently problematic, surface strategies may produce metacognitive illusions when used when learning is more complex (Bjork *et al*, 2013).

Complex tasks, on the other hand, involve deeper processing (Pieschl *et al*, 2014). Deep processing focuses on meaning (Dinsmore and Alexander, 2012; Marton and Säljö, 1976; Baeten *et al*, 2010) and emphasises the development of the rigorous content knowledge, sophisticated task-appropriate skills, conceptual understanding and long-term retention associated with ‘deep’ learning (Baeten *et al*, 2010; IB, 2014a). Deep processing involves complex, or ‘deep’ strategies that make learning difficult, such as making connections between new and previously learned concepts (Gibbs and Coffey, 2004; Heikkilä and Lonka, 2006; Kember *et al*, 2004; Kember, 2001; Baeten *et al*, 2010), reducing the number of words in notes to a quarter or less of the original text (Donker *et al*, 2014), and emphasising analysis, evaluation, and application, rather than just comprehension (Pieschl *et al*, 2014; Pieschl *et al*, 2012).

Although deep and surface approaches are often dichotomised, with a deep approach presented as leading to more effective SRL (see, for example, Heikkilä and Lonka, 2006), an information processing perspective foregrounds task analysis, highlighting the fact that effective self-regulating learners flexibly adapt their strategy use to the complexity and demands of the task (Pieschl *et al*, 2014; Pieschl *et al*, 2012). Thus, an exploratory orientation along with opportunities to experiment and practise are considered vital to the development of SRL from this perspective (Winne, 2018). Because such an orientation may be related to students’ epistemic awareness (Flum and Kaplan, 2006), I now turn to a discussion of how epistemic awareness can be integrated into information processing theory.

Epistemic awareness

Epistemic awareness refers to ‘*attitudes about the nature of knowledge and how it should be acquired and evaluated*’ (Felder and Brent, 2005, p. 57). Although epistemic awareness is not an explicit element of information processing theory, it was

referred to in the early work of information processing theorists (Winne, 1995; Winne, 2010; Butler and Winne, 1995) and aligns well with Winne and Hadwin's (1998) COPES model (Muis, 2007; Muis and Singh, 2018; Winne, 2018). Applying this model, epistemic beliefs are considered internal *Conditions* that affect how students plan and *Operationalise* those plans and influence the epistemic *Standards* students generate during goal production (Muis, 2007; Winne, 2018; Pieschl *et al*, 2014). For example, Pieschl *et al* (2014)'s study, framed around the COPES model, demonstrated that students with more sophisticated epistemic beliefs were better able to adapt their strategy use to the complexity of the task.

Epistemic beliefs, such as those about the certainty and simplicity of knowledge, have implications for how students approach their learning (Patrick and Middleton, 2002; Pieschl *et al*, 2014; Winne, 2010; Muis and Singh, 2018; Winne, 1995; Muil *et al*, 2013; Lising and Elby, 2005). Students with lower levels of epistemic awareness, for example, demonstrate "pre-reflexive thinking" (King and Kitchener, 2004, p. 6). Believing in the authority of teachers and textbooks, they tend to view their own role as memorisers and replicators (Patrick and Middleton, 2002; Kember, 2001). Operating in a state of 'ignorant certainty' (Felder and Brent, 2005, p. 65), these students view knowledge as simple and certain and therefore may not perceive a need to search for alternatives or justify their conclusions with evidence (Muis and Singh, 2018). Accordingly, they may use surface strategies even when presented with complex tasks for which a deeper approach would be more beneficial (Kember, 2001; Muis and Singh, 2018; Pieschl *et al*, 2014). Low levels of epistemic awareness helps to explain why otherwise capable students can have difficulty mastering complex content (Lising and Elby, 2005).

"Quasi-reflexive" thinkers (King and Kitchener, 2004, p. 6), on the other hand, recognise that uncertainty is part of knowing and begin to understand the importance of evidence and justification. At the highest level of epistemic development, "reflexive"

thinkers (King and Kitchener, 2004, p. 6) understand the contextual, constructed nature of knowledge, use reason and evidence to justify their conclusions, and re-evaluate their conclusions when presented with new evidence (King and Kitchener, 2004). Operating in a state of ‘intelligent confusion’ (Felder and Brent, 2005, p. 65), these students are inclined to adopt deep learning strategies that foster conceptual understanding and application (Munro, 2003; Felder and Brent, 2005; Biggs, 2012; Biggs, 1993; Heikkilä and Lonka, 2006; Marton and Säljö, 1976) for complex learning tasks, but adapt their strategy use for simpler tasks (Pieschl *et al*, 2014). They are also likely to adopt an exploratory orientation, ‘translating innate curiosity to an active search for information, its examination, and evaluation in a self-reflective manner’ (Flum and Kaplan, 2006, p. 100).

2.4 Understanding SRL from a situated perspective: How what students ‘bring’ to their learning interacts with context

Students with learning difficulties

The term ‘learning difficulties’ refers to diagnoses such as dyspraxia, dyslexia, and dyscalculia that arise from ‘neurological differences in brain structure and function... affect a person’s ability to receive, store, process, retrieve or communicate information... [and] are both real and permanent’ (Cortiella and Horowitz, 2014, p. 3). These neurological differences frequently result in poor phonemic awareness, semantic awareness, processing speed (Watson *et al*, 2016; Trainin and Swanson, 2005) and other processing deficits that can have a detrimental impact on many aspects of learning and achievement. Given the importance of processing to SRL, this helps to explain why

many students with learning difficulties struggle to regulate their learning (Mason and Reid, 2018).

Compounding this situation, the processing difficulties associated with LD are frequently accompanied by underdeveloped executive functioning skills (Cortiella and Horowitz, 2014; Watson *et al*, 2016; Mason and Reid, 2018; Butler and Schnellert, 2015). Executive functioning skills are associated with a range of important aspects of learning, including starting and completing complex tasks (Mason and Reid, 2018), reading, note-taking, time management, self-advocacy (Reis *et al*, 2000) and self-regulatory processes such as planning tasks and monitoring outcomes (Cleary and Zimmerman, 2004). Both executive functioning and SRL are associated with frontal lobe processing, which further explains why many students with LD experience difficulty regulating their learning (Watson *et al*, 2016; Mason and Reid, 2018).

Related to this, limited metacognitive awareness may also impede the learning and performance of students with LD (Hübner *et al*, 2010; Harris and Graham, 1999; Miranda *et al*, 1997; Nelson *et al*, 1992; Ruban *et al*, 2003; Watson *et al*, 2016). For example, along with the ability to monitor one's own learning and performance (Flavell, 1979), metacognitive awareness involves an accurate understanding of one's own strengths and weaknesses (Cleary and Platten, 2013). Although students with LD often underestimate their potential, they also frequently overestimate their performance (Butler and Schnellert, 2015; Chen and Benbenutty, 2018). Doing so can have a positive impact on self-efficacy, which is beneficial to SRL, but it can also negatively impact effort exertion, strategy use, and adaptive help-seeking (Chen and Benbenutty, 2018), making it difficult for students with LD to self-regulate their learning and compensate for their processing weaknesses (Chen and Benbenutty, 2018; Ruban *et al*, 2003).

In addition to limitations in metacognitive awareness, students with learning difficulties also frequently struggle with cognitive aspects of learning and performance (Hübner *et al*, 2010; Harris and Graham, 1999; Miranda *et al*, 1997; Nelson *et al*, 1992;

Ruban *et al*, 2003; Watson *et al*, 2016). They often demonstrate weak academic skills, and many possess an insufficient repertoire of cognitive learning strategies (Hen and Goroshit, 2014). In relation to mathematics, many students with LD have difficulty developing conceptual understanding and skills (Watson *et al*, 2016) and, with regard to writing, they may over-prioritise mechanics and fail to view writing as a process, thus underperforming relative to their capabilities (Harris and Graham, 1999).

Because cognitive and metacognitive processing are both highly effortful (Winne, 2018), engaging in SRL can particularly tax students already disadvantaged by diagnosed processing deficits. This helps to explain why students with LD tend to use fewer and simpler strategies than their peers, have difficulty effectively adapting strategies to a particular task (Montague, 2008), and may not perceive strategies as useful (Ruban *et al*, 2003; Watson *et al*, 2016; Zimmerman, 1990). In fact, many students with learning difficulties demonstrate a reproductive, ‘survival model’ of learning (Ruban and Reis, 2006, p. 154). Because challenge and the complexity of learning activities increase throughout secondary school, working hard but not strategically can limit the effectiveness of independent learning and cause students with learning difficulties to underperform relative to their content knowledge (Watson *et al*, 2016; Ruban *et al*, 2003).

Importantly, though, the processing weaknesses associated with LD are believed to be only partly responsible for the lower levels of SRL typically demonstrated by students with learning difficulties (Mason and Reid, 2018; Butler and Schnellert, 2015). Motivation is also something that many students with LD struggle with (Yaworski *et al*, 2000). In fact, motivation is so important that it can even predict LD group membership (Sideridis and Scanlon, 2006), and nearly a quarter of referrals for academic support involve problems with motivation (Cleary, 2006).

‘Self-determination’ is one aspect of motivation that can impact the motivation of students with learning difficulties and, subsequently, their SRL (Butler and

Schnellert, 2015). Self-determination refers to feelings of competence, relatedness, autonomy (Ryan and Deci, 2000), awareness of one's own strengths and weaknesses and sense that weaknesses can be overcome (Field *et al*, 1998). Highly successful people with learning difficulties believe in their own potential, have a strong desire to take control of their own lives, and believe that 'a capacity for hard work [is] their greatest asset' (Reis *et al*, 2000, p. 131). With a positive sense of self-determination, students with LD are more likely to take responsibility for and ownership of their own learning when presented with academic challenges (Butler and Schnellert, 2015). On the other hand, limited resilience and high levels of stress, anxiety and self-doubt (Hen and Goroshit, 2014) can compound the difficulties caused by diagnosed processing deficits. Students lacking in self-determination may be more inclined to blame others, or their own ability, for negative outcomes (Ryan and Deci, 2000), negatively impacting their inclination to engage in SRL (Butler and Schnellert, 2015).

Importantly, students' perceptions of competence and control are significantly influenced by their previous experiences in school (Butler *et al*, 2011). For example, because successful students draw on what has worked for them in the past (Butler, 2002a), those who do not develop a repertoire of strategies will be increasingly disadvantaged as they progress through school (Watson *et al*, 2016; Ruban *et al*, 2003). Repeatedly experiencing failures can negatively impact self-efficacy beliefs (Lichtinger and Kaplan, 2015; Miranda *et al*, 1997), and if students relate previous successes to external factors, such as task ease or luck, and failures to ability (Schunk and Ertmer, 2000) their future engagement in learning can also be negatively impacted. However, 'the academic doubts stemming from specific skill deficits may be neutralised by the confidence to engage in self-regulatory processes like strategic planning, self-monitoring, and accurate self-evaluation' (Klassen, 2010, p. 20), underscoring the need for SRL-promoting instruction for these students from a young age.

Goal orientation has also been shown to influence the SRL of students with learning difficulties. Similar to non-LD peers, a mastery approach orientation has been associated with enhanced SRL, while the impact of a performance orientation on their SRL is less straightforward. According to Sideridis (2006), a multiplicative ‘mastery by performance’ orientation (p. 13) may be most advantageous for students with learning difficulties because such an orientation focuses students on mastering content and skills in order to achieve good grades. However, students with LD may be more likely than their peers to exhibit an ‘avoidance’ orientation (Sideridis, 2006) which, from a social cognitive perspective may diminish their propensity to engage in SRL.

Regardless of what students with learning difficulties ‘bring’ in terms of processing, efficacy, motivation and history, a situated model foregrounds the interaction between this and the context of their learning (Butler and Cartier, 2018). This emphasis on context in relation to SRL has profound implications for students with learning difficulties. One reason for this is that many of the assessments used in the diagnosis of learning difficulties measure aptitude, or *predicted potential*, based primarily on standardised measures of current processing and achievement, without accounting for previous, current, or future educational contexts. Furthermore, diagnoses do not necessarily take into account a particular student’s self-regulatory effectiveness and may fail to recognise that some students with LD are able to compensate for diagnosed processing difficulties by increasing their use of metacognitive strategies (Trainin and Swanson, 2005; Butler and Schnellert, 2015). Because the academic performance of highly self-regulated students with LD can be indistinguishable from that of non-LD peers (Harris and Graham, 1999; Reis *et al*, 2000), the usefulness of such ‘snapshot’ standardised scores may be limited as predictors of academic potential.

From a situated perspective, an SRL-promoting context, for example learning strategies interventions, may have the potential to mitigate the impact of learning difficulties on performance (Butler and Schnellert, 2015). However, if it is always the

teacher who analyses tasks and selects strategies, students may not develop the capacity or motivation to do this for themselves (Butler, 2002a; Field *et al*, 2003). Furthermore, in stand-alone strategies classes the issue of transfer can be problematic because students may not spontaneously use taught strategies when the opportunity arises (Bruer, 1997). With this in mind, embedding strategy instruction within content area instruction can be more effective for promoting SRL within students with LD (Mason and Reid, 2018; Butler and Schnellert, 2015; Montague, 2008). In fact, experiencing SRL-promoting instruction in classrooms with non-LD peers tends to result in the best outcomes for these students (Perry, 2004) and may be the only form of support some students with LD need (Butler and Schnellert, 2015).

Despite a careful review of the literature, I found only one study involving students with learning difficulties enrolled in the IB Diploma Programme. This begs the question, why does such a profound gap in the literature exist? The IB encourages schools to ensure the maximum access to the Diploma Programme possible for students with a wide range of abilities, including students with LD (IB, 2009). Moreover, it is possible for students to pursue individual course certificates, rather than the full Diploma. However, IB schools are required to encourage learners of all abilities to attempt the full Diploma, rather than pursue individual certificates (IB, 2010; IB, 2009). To support them, special exam and assessment accommodations including deadline extensions, additional time during exams, scribes, support with practical work, use of a word processor, and readers can be arranged to mitigate the impact of learning difficulties on students' achievement in the DP (IB, 2018).

Providing further insight into why the Diploma Programme may be a suitable programme for some students with LD, it has been designed as an inclusive programme in which learning how to learn 'is not taught as a separate course... it [is] infused naturally into the curriculum as part of the teaching and learning process' (IB, 2009, p. 8). DP teaching is meant to be student-centred, differentiated, varied, build on what

students already know and can do, engage students in reflection, and support them in becoming actively responsible for their own learning (IB, 2010). In fact, the pedagogy espoused by the IB mirrors the ‘empirically-based qualities of SRL-supportive environments’ described by Butler and Schnellert (2015, p. 130). The practical support available, combined with SRL-promoting pedagogy, suggest that the IB Diploma Programme may be an appropriate academic curriculum for university-bound students with learning difficulties.

High-achievers

I now turn to a discussion of opportunities and limitations related to the development of SRL in high-achievers. It is important to note at the outset of this discussion that although much of the literature reviewed was drawn from the field of ‘gifted’ education, this term has been replaced with the term ‘high-achieving.’ This decision was influenced by contemporary brain development research that suggests that setting limits on people’s potential for learning through labels such as ‘gifted’ is misguided (Matthews and Foster, 2005).

This discussion, therefore, is underpinned by the stances that although there is an inheritable component to ability, high achievement is also a ‘habit of mind’ (VanTassel-Baska, 1997, p. 9) that involves striving (VanTassel-Baska, 1997), effort, perseverance, and commitment (Subotnik *et al*, 2011; Hwang *et al*, 2014; Tannenbaum, 2003) and requires complex conditions to develop (Ziegler *et al*, 2012). Self-regulated learning is an important aspect of this, enabling people to transform their abilities into high achievement (Toering *et al*, 2012). In fact, inherent in many conceptions of ‘giftedness’ are aspects of SRL, including task commitment (Renzulli, 1988; Reis and Renzulli, 2010; Renzulli, 2012), adaptive affect (Tannenbaum, 2003), and motivation

(Clinkenbeard, 2012; Tannenbaum, 2003). Moreover, like theories of SRL, most conceptions of giftedness suggest that achievement is influenced by a range of personal, environmental, and behavioural factors (Clemons, 2008).

With this in mind, Ruban and Reis (2006) describe high-achieving students as possessing ‘an arsenal of self-regulatory methods that help them succeed in academic settings’ (p. 148). This includes advanced metacognitive (Gaultney, 1998; Reis *et al*, 2000; Morisano and Shore, 2010; Pajares and Kranzler, 1995), cognitive (Morisano and Shore, 2010; Ruban and Reis, 2006) and epistemic awareness (Muil *et al*, 2013) when compared with their peers. Indeed, Sternberg’s (2003) Triarchic Abilities Model of Intelligence, which Ruban and Reis (2006) link with SRL, is based on the premise that, while experience and context also play a role, processing aptitudes greatly influence analytic abilities, insightfulness, intuitiveness, creativity, and practical abilities. High-achieving students often demonstrate greater ‘cognitive capacity to deal with complex issues and to learn material in a more meaningful way’ (Ruban and Reis, 2006, p. 154) than do their peers. They are also understood to be more effective at calibrating their performance (Chen and Bembutty, 2018).

Nevertheless, according to Pajares and Kranzler (1995), ‘the influence of ability on some academic performance is also due, at least in part, to what students actually believe they can accomplish’ (p. 426). While high-achieving students frequently demonstrate high levels of self-efficacy (Schunk and Ertmer, 2000; Clinkenbeard, 2012; Zimmerman and Martinez-Pons, 1990; Wolters, 2010; Ruban and Reis, 2006) this relationship appears to be reciprocal, as high self-efficacy leads to greater motivation and more effective SRL overall, in turn enhancing achievement (Zimmerman, 2000). The highest achievers also tend to exert sufficient effort (Toering *et al*, 2012), set more challenging goals, closely monitor their performance (Ruban and Reis, 2006), and reflect, providing themselves with insights into the effectiveness of their strategies and

giving them ‘high levels of control over their performance development’ (Toering *et al*, 2012, p. 9).

High-achieving students also tend to engage in a wide repertoire of learning strategies (Zimmerman and Martines-Pons, 1990; Ruban and Reis, 2006; Munro, 2003) that are more advanced and more effective than those of their peers (Schunk and Ertmer, 2000; Zimmerman and Martinez-Pons, 1990; Ruban and Reis, 2006). They are also more likely to invent complex strategies, adapt them, and transfer them to new situations (Ruban and Reis, 2006). For example, Munro (2003) found that, with regard to the IBDP Extended Essay, the highest achievers paid close attention to task criteria, while lower achievers did not.

Nevertheless, not all secondary students with a history of high achievement demonstrate high levels of SRL. In fact, many potentially high-achievers ‘never rise above mediocrity’ (Renzulli, 2012, p. 152). It has been estimated that as many as 50 per cent of students who meet ‘gifted’ criteria experience ‘episodic’ underachievement (Peterson, 2000; Peterson and Colangelo, 1996) or ultimately fail to meet their potential (Stoeger and Ziegler, 2005; Reis and Renzulli, 2010; Morisano and Shore, 2010). As with other students, context can significantly influence whether high-achieving students develop the self-regulatory capacities that enable them to fulfil their early promise.

One aspect of context that has frequently been associated with the development of SRL in high-achievers, particularly strategy use, is the level of challenge in the curriculum (Ritchotte *et al*, 2014; Baslanti and McCoach, 2006; Hwang *et al*, 2014; Matthews and McBee, 2007; Reis and McCoach, 2000). Because SRL is highly effortful, using strategies for easy tasks can be unnecessary, even cognitively costly, for students who demonstrate superior information processing (Gaultney, 1998; Reis *et al*, 2000). Furthermore, in order for SRL processes to be activated, a student must perceive a need for them (Järvenoja *et al*, 2015).

Butler *et al* (2011) refer to students who are able to perform well without implementing self-regulatory strategies as ‘inactively efficient’ (p. 92). Although coasting on ability may not negatively impact performance in primary and middle school, doing so may limit early strategy development (Reid, 2011; Clemons, 2008; Gaultney, 1998; Ritchotte *et al*, 2014) and result in high-achievers ‘systematically learning not to work’ (Reis and Renzulli, 2010, p. 313). When challenge increases, even the brightest students need to regulate their learning in order to achieve to their potential (Ritchotte *et al*, 2014; Baslanti and McCoach, 2006; Hwang *et al*, 2014; Matthews and McBee, 2007; Reis and McCoach, 2000). Those who have not learned to do so may experience self-doubt as challenge and competitiveness increase (Ritchotte *et al*, 2014), negatively impacting their efficacy for SRL (Pajares and Valiante, 2002; Usher and Pajares, 2008; Caprara *et al*, 2008). Because limited SRL disadvantages even previously high-achieving secondary school students (Clemons, 2008; Gaultney, 1998). SRL-promoting environments can be beneficial for high-achievers (Carber and Reis, 2004; Tookey, 1999; Renzulli, 2012).

The DP appears to be well-aligned with the type of education advocated by several models of giftedness, including the Schoolwide Enrichment Model (Carber and Reis, 2004), Renzulli’s Three-Ring Model of Giftedness (Renzulli, 2012), and Sternberg’s Triarchic Theory of Intelligence (Tookey, 1999). Moreover, Tookey (1999) argues that ‘the habits of thought and approach that are developed over the two years of the programme parallel what research and anecdote have shown [high-achieving] students need’ (p. 54). The US National Association for Gifted Children (NAGC) considers the DP an appropriate option for high-achieving secondary school students (Culross and Tarver, 2011), and the DP is often used as a ‘school-within-a-school’ gifted programme (Matthews and Kitchen, 2007; Hertberg-Davis and Callahan, 2008; Poelzer and Feldhusen, 1997; Taylor and Porath, 2006; Tookey, 1999). Nevertheless, there are relatively few studies exploring the potential of the IB Diploma Programme to develop

SRL in students who bring with them a history of high-achievement (Hertberg-Davis and Callahan, 2008).

2.5 SRL-promoting instructional environments

One aspect of context that plays a significant role in students' development of SRL is teaching approach (Patrick and Middleton, 2002; Schunk and Zimmerman, 2007; Butler and Schnellert, 2015). The term 'teaching approach' frequently refers to the adoption of either a 'teacher focus,' emphasising 'delivery' of content through methods such as lectures, or a 'student focus' in which learning is emphasised through the promotion of active student engagement (Gibbs and Coffey, 2004; Biggs, 2012; IB, 2014a). Researchers from each of the three theoretical perspectives underpinning this investigation agree about the potential of a student-focused teaching approach to enhance SRL (Azvedo *et al*, 2008; Patrick and Middleton, 2002; Winne, 2010; Schunk and Zimmerman, 2007; White and DiBenedetto, 2018; Butler and Schnellert, 2015). As well as being considered 'SRL-promoting' generally, a student-focused environment is also considered beneficial for students with learning difficulties (Mason and Reid, 2018; Butler and Schnellert, 2015) and high-achievers (Renzulli, 2012; Tookey, 1999; VanTassel-Baska, 2000; Stoeger and Ziegler, 2005) specifically.

For example, because student centred instruction is underpinned by a constructivist epistemology, it is more concerned with the processes than the products of learning (Perrenoud, 1998; Butler and Schnellert, 2015). Thus, it utilises modelling, scaffolding and process feedback while encouraging students to gradually develop autonomy with the strategies and processes that support learning and performance (Hoyle and Dent, 2018; Schunk and Zimmerman, 2007; White and DiBenedetto, 2018; Schunk and Ertmer, 2000; Butler and Schnellert, 2015). Furthermore, the emphasis in

student-centred instruction is on complex tasks (Anyichie and Butler, 2017) and higher-level thinking (Sivan *et al*, 2000; Butler and Schnellert, 2015) and it is the student, not the teacher, who is expected to do most of the work (Sivan *et al*, 2000). As described above, high levels of engagement in a process-focused environment support the learning and development of SRL in both students with LD and high-achievers.

I now turn to a discussion of the potential of three student-centred teaching practices (collaborative learning, process-focused instruction, and formative assessment) to facilitate self-regulated learning. In doing so, I integrate concepts from social cognitive, information processing, and situated perspectives on self-regulated learning, further illustrating the utility of adopting an integrated theoretical stance.

Collaborative learning

Collaborative learning activities have great potential to support students in developing SRL (Perry *et al*, 2018; Hadwin *et al*, 2018). One reason for this is that collaborative learning activities encourage articulation amongst group members of metacognitive processes (Black *et al*, 2006; Patrick and Middleton, 2002) such as planning, strategy use, monitoring, and evaluation, resulting in shared regulation (regulation shared between equally knowledgeable learners) and potentially improving students' engagement in these processes. Moreover, as cognitive load can be shared amongst group members, collaboration can reduce the cognitive load for individual students, enhancing processing when solving complex problems (Janssen *et al*, 2010). Collaborative learning activities can also be used to promote epistemic curiosity and an awareness of multiple perspectives in students by orchestrating constructive academic controversy and conceptual conflict (Johnson and Johnson, 1979).

Collaborative learning can also result in the ‘co-regulation’ (Perry *et al*, 2018; Hadwin *et al*, 2018) that occurs through interactions between more and less sophisticated learners. Expert learners often relish the challenge of articulating their thinking to less experienced group members who, in turn, benefit from having access to their groupmates’ more advanced thinking (Perry *et al*, 2018; Mannion and Mercer, 2016) as well as from articulating their own thinking. The social interdependence resulting from collaborative learning activities can also enhance students’ perceptions of the supportiveness of the learning environment, in turn positively influencing motivation and effort (Johnson and Johnson, 2009), leading to more effective SRL.

Process-focused instruction

Process-focused instruction is also vital to the development of self-regulated learning (Butler and Schnellert, 2015). ‘Process-focused’ instruction, as described by Montague (2008), involves ‘direct explanations... verbal modelling, questioning, and demonstrations by the teacher of the steps and processes in the cognitive routine; systematic prompts and cues... [and] “think aloud” to model task completion or problem solving’ (pp. 37-38). In the context of process-focused instruction, students are also encouraged to reflect on their learning and actively explore strategies (Li, 2012).

Cognitive apprenticeship (Brown *et al*, 1989; Collins *et al*, 1991) is one type of process-focused instruction. Cognitive apprenticeship exposes students to ‘authentic ways of thinking of a culture and its conceptual viewpoint, as much as its subject matter’ (Brown *et al*, 1989, p. 38). Concerned with the gradual development of expertise through modelling, scaffolding, coaching and fading (Collins *et al*, 1991), cognitive apprenticeship is well-aligned with the observation, emulation, self-control, and self-

regulation levels of competence described by social cognitive theorists (Schunk and Zimmerman, 2007; Usher and Schunk, 2018; White and DiBenedetto, 2018).

Formative assessment

Formative assessment has frequently been linked with self-regulated learning (Nicol and MacFarlane-Dick, 2006; Butler and Schnellert, 2015; Black and Wiliam, 2009; White and DiBenedetto, 2018). The fundamental characteristic of formative assessment is that evidence of learning is used to inform teaching and drive learning forward (Black and Wiliam, 2010; Black *et al*, 2004; Wiliam, 2011). Importantly, formative assessment is situated in context and ‘cannot be detached from the learning milieu in which it is undertaken’ (Wiliam, 2011, p. 6). As students’ motivation, perceptions, and assessment histories influence how they receive and apply feedback (Wiliam, 2011), interactive dialogue, rather than a top-down ‘telling,’ is vital to the success of this approach (Black and Wiliam, 2010; Nicol and MacFarlane-Dick, 2006; Ruiz-Primo, 2011).

Formative assessment is inherently metacognitive in nature (Perrenoud, 1998), aiming to probe students’ thinking, help them reflect and explore (Black and Wiliam, 2010; Black *et al*, 2004), facilitate goal-setting (Black *et al*, 2004), encourage self-monitoring (Black *et al*, 2004; Nicol and MacFarlane-Dick, 2006), and enhance self-efficacy and motivation by ensuring students understand the processes by which they can improve (Black *et al*, 2004; Nicol and MacFarlane-Dick, 2006). Any goal-guided, process-focused dialogue, whether formal or informal, is considered formative assessment when it is used by the student to enhance learning (Ruiz-Primo, 2011; Wiliam, 2011). When students have a clear understanding of criteria (Black and Wiliam, 2010; Black *et al*, 2004; Dann, 2014; Nicol and MacFarlane-Dick, 2006) and how to

proceed based on feedback (Havnes *et al*, 2012; Nicol and MacFarlane-Dick, 2006; Wiliam, 2011), formative assessment represents a ‘safe’ assessment culture that can enhance efficacy, affect and motivation (Li, 2102; Perry *et al*, 2002).

2.6 The International Baccalaureate Diploma Programme and SRL

The overarching aim of this investigation was to understand how, in the context of an IB Diploma Programme in which teachers are learning to be more student-centred and teach ATL skills, the self-regulated learning of high-achieving students and those with learning difficulties evolves. This chapter has thus far discussed relevant aspects of SRL foregrounded by three theoretical perspectives and illustrated how an integrated theoretical stance contributes to a comprehensive view of SRL and how it relates to students with learning difficulties and high-achievers. This chapter has also explored SRL-promoting teaching practices in order to later relate them to participants’ perspectives of ‘good teaching.’ I now explore potentially SRL-promoting elements of the IB Diploma Programme and discuss why, in reality, SRL may be difficult to achieve while students are still enrolled in the programme.

Potentially SRL-promoting aspects of the Diploma Programme

As mentioned previously, SRL has generally been linked with a constructivist epistemological stance (see Dombrowski *et al*, 2010; Patrick and Middleton, 2002; Anyichie and Butler, 2015; Butler and Schnellert, 2015) and it is constructivist, student-centred teaching that is generally considered SRL-promoting. The IB has underpinned the DP curriculum with a constructivist epistemology, taking a view of knowledge as

actively constructed and of learning as a process and not a product (IB, 2014b). With this in mind, DP teachers are encouraged to take a “metacognitive approach” (IB, 2009, p. 8) to teaching and learning and are discouraged from ‘teaching to a textbook’ (p. 9) or involving students as ‘passive recipients’ (p. 37). With the aim of developing conceptual understanding, rigorous content knowledge, and long-term retention in DP students, the voice of the learner, not just the teacher, is encouraged (IB, 2009; IB, 2014b).

The IB is also explicitly concerned with developing DP students into self-motivated, curious, confident learners who know how to learn and can apply their learning in any situation (IB, 2009). To this end, DP teachers are expected to explicitly teach Approaches to Learning skills (IB, 2016; IB, 2015). The IB (2015) defines ATL skills as *‘deliberate strategies, skills, and attitudes that permeate the IB teaching and learning environment [and] support the IB belief that a large influence on a student’s education is not only what you learn but also how you learn’* (p. 1). Although the IB itself does not explicitly link ATL with self-regulated learning, ATL includes critical thinking, reflection, research and self-management skills (see Table 1, below), mirroring many of the processes involved in self-regulated learning. Demonstrating further alignment with theories of self-regulated learning, in teaching ATL skills, teachers are expected to provide students with transparent expectations, models, and opportunities to practise so they develop ‘clear and sophisticated understandings of how they learn best and how they can evaluate the effectiveness of their learning’ (IB, 2014a, p. 21).

The IB’s pedagogical guidance written explicitly for DP teachers is also highly congruent with SRL-promoting instruction. This guidance specifies that students should be introduced to assessment expectations, criteria and practices very early in the programme and given plentiful opportunities to practice alongside meaningful formative assessment that helps them develop their understanding of what constitutes excellence, as well as how to get there (IB, 2009). In fact, although final examinations in the DP are

[Table 1: IB Approaches to Learning skills excerpted from IB, 2014a, pp. 98-103]

Communication skills	<ul style="list-style-type: none"> • Preview and skim texts to build understanding • Negotiate ideas and knowledge with peers and teachers • Participate in and contribute to digital social media networks • Make effective summary notes when studying
Collaboration skills	<ul style="list-style-type: none"> • Take responsibility for one's own actions • Give and receive meaningful feedback • Listen actively to other perspectives and ideas • Advocate for one's own rights and needs
Reflection skills	<ul style="list-style-type: none"> • Develop new skills, techniques, and strategies for effective learning • Identify strengths and weaknesses of learning strategies • Demonstrate flexibility in the selection and use of learning strategies • Try new ATL skills and evaluate their effectiveness
Self-management skills	<ul style="list-style-type: none"> • Plan short and long-term deadlines • Set goals that are challenging and realistic • Plan strategies and take action to achieve personal and academic goals • Use appropriate strategies for organising complex information
Research skills	<ul style="list-style-type: none"> • Make connections between various sources of information • Seek a range of perspectives from multiple and varied sources • Use critical-literacy skills to analyse and interpret media communications • Collect, record, and verify data
Thinking skills	<ul style="list-style-type: none"> • Recognise unstated assumptions and bias • Evaluate evidence and arguments • Draw reasonable conclusions and generalisations • Revise understandings based on new information and evidence • Consider ideas from multiple perspectives • Develop contrary or opposing arguments
Affective skills	<ul style="list-style-type: none"> • Practise strategies to reduce stress and anxiety • Practice bouncing back after adversity, mistakes or failures • Practise failing well • Practise dealing with disappointment and unmet expectations

comprised of high stakes summative assessments, ‘the single most important aim of assessment in the DP is that it should support and encourage future learning’ (IB, 2008, p. 20). With this in mind, all assessed work is evaluated using established and well-articulated subject-specific assessment criteria (Tookey, 1999), and students and teachers are expected to routinely engage in ‘reflection, self-assessment and conferencing’ (IB, 2006, p. 2) based on these criteria.

Evidencing further alignment between the DP and SRL-promoting practice, the IB’s mission statement (IB, 2014b) emphasises developing students’ awareness that ‘other people, with their differences, can also be right’ (p. i), suggesting a concern for

enhancing epistemic awareness. Supporting this, what matters most in the IB curriculum continuum is the development of ‘powers of the mind or ways of thinking’ (IB, 2014a, p. 15), rather than memorisation and replication. Thus, a range of objectives in the various subject groups require students to evaluate and reflect upon their knowledge claims (IB, 2009). Moreover, in the Extended Essay, students critique their sources, process, and conclusions, and in TOK students reflect on themselves as ‘knowers’ (Tookey, 1999), examine knowledge claims and their associated assumptions, justify their own claims, and identify the implications of the various claims they make (Dombrowski *et al*, 2010).

In discussing teaching practices in IB schools, Codrington (2004) asserts that ‘best practice’ constructivist teaching and learning aims to develop ‘reasoning, critical and creative thinking skills, problem solving, retention and use of understandings, cognitive transfer of concepts and metacognitive reflection of experience, all through open-ended learning experiences’ (p. 179). Empirical evidence suggests that IBDP students do indeed develop creative and critical thinking skills (Taylor and Porath, 2006; Culross and Tarver, 2011; Wright, 2015), effective communication skills (Culross and Tarver, 2011), and the social, emotional and metacognitive skills that enable them to take responsibility for their own learning (Conley *et al*, 2014). However, research also suggests that many DP students are unaware that developing learning skills is part of the IB Diploma Programme curriculum (Conley *et al*, 2014). I now turn to a discussion of why DP teachers may not adopt the student-centred approach espoused by the IB, why students may not welcome such an approach, and why this situation may limit the development of self-regulated learning while students are still enrolled in the programme.

Why teaching and learning may limit the development of SRL while students are enrolled in the Diploma Programme

As suggested above, taken together, the approaches to teaching and learning the IB expects DP teachers to engage in are well-aligned with ‘empirically-based qualities of SRL-supportive environments’ (Butler and Schnellert, 2015, p. 130), and many DP students do appear to graduate as self-regulating learners (Conley *et al*, 2014). However, even high-achieving students have dropped the DP because of rigid teaching and learning or lack of support (Hertberg-Davis and Callahan, 2008). Furthermore, Conley *et al* (2014) suggest that the development of learning skills associated with the IBDP is more likely a result of programme components, such as TOK and the Extended Essay, rather than teaching. What accounts for this gap between espoused pedagogy and classroom reality?

One possible explanation is that teachers in secondary schools (Butler *et al*, 2011) and rigorous academic programmes in general (Bjork *et al*, 2013) often expect students to already know how to learn. IB Diploma Programme teachers, for example, tend to associate success in the DP with an enthusiasm for learning, a solid work ethic, and effective organisation (Culross and Tarver, 2011), study (Hertberg-Davis and Callahan, 2008) and time management skills (Culross and Tarver, 2011; Hertberg-Davis and Callahan, 2008). Although Butler *et al* (2013) argue that students ‘cannot be expected to just “know” how to engage in academic practices’ (p. 14), DP teachers often do not view teaching these as their responsibility (Culross and Tarver, 2011).

Furthermore, teachers and administrators may be reluctant to shift to a student-centred approach or take time to embed ATL skills into the curriculum because of the nature of the DP’s ‘detailed content and rigorous test preparation curriculum’ (Li, 2012, p. 27), combined with the fact that the DP ‘brand’ is so closely linked to successful university admissions (Hallinger *et al*, 2011). Although embedding explicit instruction

of strategies into process-focused instruction does not have to take much instructional time (Harris and Graham, 1999; Perry *et al*, 2002), a student-centred approach aimed at changing the working habits of students can be time-consuming to plan and implement (Black and Wiliam, 2010). Therefore, shifting from a traditional to a student-centred approach within the context of such a highly rigorous curriculum can be extremely daunting (Twigg, 2010; Kember, 2001; Black and Wiliam, 2010; Black *et al*, 2004).

Another reason why teachers may not implement a student-centred teaching approach is that teachers often hold the same misconceptions that students hold (Bjork *et al*, 2013), and the assumptions, beliefs and attitudes they hold about teaching and learning tend to influence the approach they take (Hillocks, 1999). According to Bjork *et al* (2013), teachers holding misconceptions (such as memory can record and play back ‘transmitted’ information, quick responses indicate learning, and mistakes are something to be avoided) often engage in practices that make learning easier for their students. These include providing students with correct answers and presenting topics one at a time, rather than encouraging students to engage in the ‘desirable difficulties’ that promote more effective learning.

Furthermore, although a student-centred approach is considered ‘SRL-promoting’ (Patrick and Middleton, 2002), a belief that content is the most important thing teachers can ‘deliver’ to students remains prevalent in today’s schools (Bjork *et al*, 2013). Thus, even if individual teachers have accurate conceptions of what effective learning entails, their students may not share those conceptions (Butler *et al*, 2011). In fact, it is ‘widely reported that students often try to lure the teacher back to the status quo when they are exposed to changes in pedagogy’ (O’Boyle, 2009, p. 51). Students who possess epistemic beliefs that reflect an understanding of knowledge as defined by an authority, transmitted by the teacher, and reproducible by them may be particularly likely to resist a more student-centred approach (Black and Wiliam, 2010; Kember, 2001; Li, 2012), especially if they are used to having teachers organise their learning,

prompt them to study, and reteach them if they fail to learn the first time around (Hadwin, 2013; Kember, 2001).

Students may also not welcome a student-centred approach because of the effort such an approach requires. When given a choice, many students look for the easiest, rather than the most effective, way of learning something (Black and Wiliam, 2010; Bjork and Bjork, 2011, McCabe, 2011). Furthermore, students who are not well-equipped with the skills or attitudes necessary for learning in student-centred environments may struggle when required to take a more active approach (Hadwin, 2013; Kember, 2001). This may be equally true for high-achieving students who find the DP to be their first experience with academic challenge as it is for their peers (Hertberg-Davis and Callahan, 2008; Taylor and Porath, 2006).

Having little genuine interest in learning how to learn presents an additional obstacle in developing the capacity to take ownership of one's own learning (Black *et al*, 2006). For example, students who enrol in the DP because they believe it will give them access to competitive universities may focus on 'acquisition of content, acquisition of credentials, acquisition of college credit, acquisition of desirability in college admissions officers' eyes' (Hertberg-Davis and Callahan, 2008, p. 210) instead of learning. Without genuine interest in the opportunities offered by DP teaching and learning, the extra effort required for SRL may be unappealing for these students.

Furthermore, although students must encounter challenge in order to cultivate SRL (Hadwin, 2013), fast-paced, chaotic learning environments and overly demanding tasks may limit the cognitive and metacognitive resources available for self-regulation (Usher and Schunk, 2018). The requirements of the DP exceed the graduation requirements for many other secondary school programmes (Shaunessy and Suldo, 2010; Taylor and Porath, 2006) and this can be stressful, especially for students lacking self-regulatory skills (Culross and Tarver, 2011; Hertberg-Davis and Callahan, 2008; Wright, 2015).

To cope with the workload, many DP students develop maladaptive strategies such as perseverating on their difficulties, not seeking help, assignment sharing, negotiating deadlines (Shaunessy and Suldo, 2010) and pulling ‘all-nighters’ (Taylor and Porath, 2006, p. 153). Even if they feel the programme is worth the sacrifices they make, the workload may impact the social lives and sleep of even the highest achievers (Hertberg-Davis and Callahan, 2008; Taylor and Porath, 2006). It is not thus uncommon for DP students to feel negatively about pursuing the Diploma while engaged in the programme (Taylor and Porath, 2006).

Chapter 3: Research Design and Methods

Chapter 2 reviewed 1) the three prevalent theoretical perspectives of SRL underpinning this investigation; 2) how SRL from an integrated perspective relates to students with learning difficulties and high-achievers, and; 3) SRL-promoting instructional environments, including three teaching practices frequently associated with self-regulated learning. It concluded with a discussion of SRL-promoting elements of the IB Diploma Programme and why DP students may struggle to regulate their learning while still enrolled in the programme. Gaps in the literature were particularly identified in relation to DP students with learning difficulties, the role of Approaches to Learning skills in developing SRL in IB Diploma Programme students, and the potential of Diploma Programme teaching and learning to enhance SRL in students with learning difficulties and high-achievers. This study set out to address these gaps. The current investigation was underpinned by the overarching research question:

How, in an IB Diploma Programme in which teachers are learning to be more student-centred and explicitly teach ATL skills, does the self-regulated learning of high-achieving students and those with learning difficulties evolve?

Investigating self-regulated learning as a process that develops over an extended period of time presents significant methodological challenges for researchers (Hadwin *et al*, 2004). The ‘situatedness’ of SRL (Butler and Carter, 2018), and the paucity of methods that can ‘simultaneously track patterns in which elements simultaneously represent the topic (subject matter, features of a group process, a learner’s affect) in the same unit as a representation of the cognitive operations applied to that topic’ (Roll and Winne, 2015, p. 11), only complicates this situation further. Thus, trying to understand

how self-regulated learning evolved over the course of the two-year IB Diploma Programme was an ambitious aim.

This chapter outlines how this investigation was undertaken. After presenting the research sub-questions, it describes the design, methodology, methods, sample, and methods of analysis. Due to my insider status, reflexivity was a particular and on-going concern throughout the investigation. Therefore, great care was taken to enhance the trustworthiness of my findings. This chapter concludes with a description of how these issues were addressed.

3.1 Research sub-questions

Along with the overarching question stated previously, four sub-questions, designed to comprehensively illuminate how the SRL of high-achieving IBDP students and those with learning difficulties in this context evolved, guided this study. Following Stake (2006) and Miles and Huberman (1994), developing these research questions was a deductive, iterative process whereby the original questions, based on the literature review and concept map, were refined throughout data collection and analysis. The sub-questions guiding this investigation were:

1. In this context, how do high-achieving IB Diploma Programme students and those with diagnosed learning difficulties develop self-regulated learning?
2. In this context, do the strategies that high-achieving IBDP students use to regulate their learning differ from those students with learning difficulties use? If so, how do they differ and what accounts for these differences?
3. In this context, what teaching approaches do high-achieving IBDP students and those with learning difficulties consider to be ‘good teaching’? How do

these relate to SRL-promoting teaching approaches identified in the literature and espoused by the IB?

4. In this context, how important do high-achieving IBDP students and those with learning difficulties think it is for teachers to teach them Approaches to Learning skills?

The epistemological stance underpinning this study was constructivist. It was assumed that effective learners actively engage in their learning, that self-regulation is necessary for success in this endeavour, and that there is a responsibility on the part of teachers and school leaders to ensure that the school context supports students in understanding their role in the learning process and in developing the knowledge, skills, attitudes, values, beliefs and behaviours that comprise SRL, regardless of their varying ‘starting places.’

3.2 Methodology and Design

Early SRL researchers, conceptualising SRL as an aptitude, generally relied upon surveys (Patrick and Middleton, 2002) to understand self-regulation. However, SRL researchers have increasingly conceptualised SRL as an event (Butler, 2002b; Patrick and Middleton, 2002) or series of events (Hadwin *et al*, 2004), developing a range of qualitative methods, such as think-alouds and examining trace data, to understand how SRL events ‘unfold.’ In designing this investigation, rather than being interested in SRL as an aptitude, event, or series of events, I was interested in how SRL had evolved over the course of the two-year IB Diploma Programme, particularly how students had independently approached their learning and whether and how the context may have, over time, influenced this.

The IB (2015) describes ‘Approaches to Learning’ as deliberate strategies, skills and attitudes that reflect a belief that how a student learns is as important as what she learns. Butler (2002a) associates ‘approaches to learning’ with a long-term view of learning, distinguishing this from a focus on the task at hand. Butler *et al* (2011) suggest that effective ‘approaches to learning’ enable students to meet the demands of different subjects and text types. Furthermore, Anyichie *et al* (2016) argue that self-regulated ‘approaches’ engage students in controlling their actions in order to respond to contextual challenges and meet their goals. These differing but well-aligned perspectives with respect to students’ approaches to learning were well-suited to this investigation. With this in mind, I framed SRL as an *approach*.

In selecting methods, I was aware that in educational contexts, ‘people’s practices and experiences... [display] uncertain, complex, messy, and fleeting properties, which together call for distinctive research approaches to description, understanding, and explanation’ (Freebody. 2003, p. 81). Furthermore, I understood that to establish credibility, methodological decisions must be connected to research purposes (Butler, 2002b). However, an analysis of the methods typically used to understand SRL as an aptitude, event, or series of events (Butler, 2002b; Zimmerman, 2008; Hadwin *et al*, 2004; Patrick and Middleton; 2002) revealed few that were suitable for investigating SRL as an approach that evolves over time. The same is true of the field of ‘approaches to learning’ (see Biggs, 1993; Biggs *et al*, 2001; Kember *et al*, 2004; Kember, 2001; Gibbs and Coffey, 2004; Baeten *et al*, 2010), where surveys and interviews have been widely used to understand students’ strategy depth and how that relates to instructional practices.

The first decision I made was whether to implement a quantitative or qualitative methodology. Butler (2002b) argues that qualitative methods are ideal when investigating SRL and SRL-promoting contexts. Qualitative methods have great potential to enhance understandings of how students perceive the contexts in which they

learn, how those perceptions influence how they go about learning, and why they go about it in the way that they do (Perry *et al*, 2002). The dual emphasis in this investigation on learners' approaches and perspectives as their SRL evolved within a particular DP context made a qualitative methodology optimal.

Next, I needed to select a methodological approach that would help me answer my research questions. The complexity of understanding SRL in context weaves a tangled methodological web for researchers (Hadwin *et al*, 2004; Meyer and Turner, 2002; Roll and Winne, 2015; Winne, 2010; Cascallar *et al*, 2006), which any individual data collection method risks underestimating (Roll and Winne, 2015; Butler and Cartier, 2018). On the other hand, because different methods have the potential to provide different types of information (Patrick and Middleton, 2002), case studies have potential to preserve the complexity of SRL in context (Kaplan *et al*, 2011; Cleary and Platten, 2013).

Case studies offer many advantages to researchers attempting to understand the complexity of SRL. For example, they offer the opportunity to analyse multiple data sources in real-life settings (Twigg, 2010), from differing perspectives (Anyichie *et al*, 2016), and to develop an in-depth understanding of a range of external and internal influences as they interact within a particular context (Butler and Cartier, 2018). Furthermore, case studies do not take contextual influences as 'background variables, but rather lived dimensions that are indigenous' (Freebody, 2003, p. 81) to the activities that students engage in as they learn. They are particularly suitable for understanding 'how and why pedagogical practices are associated with students' engagement in more effective forms of SRL' (Butler and Cartier, 2018, p. 353). Thus, researchers have increasingly turned to case studies to illuminate the complexities of SRL within particular contexts (Hadwin *et al*, 2004; Patrick and Middleton, 2002; Butler and Cartier, 2018; Butler *et al*, 2011).

Multiple case studies have the added benefit, while remaining true to a view of SRL as situated in context (Butler *et al*, 2011), of helping researchers identify the patterns, differences, and conditions under which findings apply for groupings of students with ‘related backgrounds, learning challenges, or experiences’ (Butler *et al*, 2011, p. 79). Stake (2006) refers to such groupings as ‘quintains’ and suggests that ‘the unique life of [each] case is interesting for what it can reveal about the quintain’ (p. vi). He argues that, by seeking out multiple perspectives, comparing across cases and presenting differing, even contrasting views, we develop our insights into the quintain we are trying to understand. Because I aimed to understand how the SRL of two ‘quintains,’ high-achieving students and those with learning difficulties, evolved within the IB Diploma Programme, I selected a multiple case study design.

3.3 Methods

PHASE ONE: MULTIPLE CASE STUDIES

As explained above, this investigation aimed to understand how the self-regulated learning of high-achieving students and those with learning difficulties evolved within the context of a particular IB Diploma Programme. I hoped to illuminate individual-context interactions (Butler *et al*, 2011), in particular what these students ‘brought’ to their learning and how that interacted with their educational context to shape their self-regulatory processes. As part of this (Research Question 2), I hoped to find out if the strategies used by participants in each quintain differed and, if so, what accounted for any differences. One way to find out what sorts of strategies students use, that sidesteps limitations presented by surveys, is to ask them (Bjork *et al*, 2013). However, what students *say* they do is not necessarily what they *actually* do (Cleary and

Platten, 2013; Kaplan *et al*, 2011). An analysis of the academic products that students create while studying can mitigate this limitation (Lichtinger and Kaplan, 2015; Hadwin *et al*, 2004). Thus, each case study participant self-selected and submitted between four and six *work samples* (Butler and Cartier, 2018; Lichtinger and Kaplan, 2015) that they felt reflected their approaches to learning within the IB Diploma Programme.

Although work samples have great potential to demonstrate how participants implemented particular strategies, in and of themselves they cannot provide sufficient insight into why participants implemented those strategies in the way that they did. Boekaerts and Cascallar (2006) argue that accurate information about students' *awareness* of the SRL strategies they use is just as important as identifying the strategies they use. Self-report tools 'provide insight into students' understandings of themselves as learners and about the learning process' (Butler *et al*, 2011, p. 97). Thus, case study participants submitted written *cued/prompted reflections* (Butler and Cartier, 2018; Hadwin *et al*, 2004) describing why they selected the strategies represented by their work samples, the learning goals underpinning their strategy use, whether their strategies were successful, and how they knew (see Appendix B). As these reflections involved participants in the 'analysis and description of their own learning activities' (Hadwin *et al*, 2004, p. 368), they helped me address Research Questions 1 and 2.

To provide further insights into students' understandings of themselves as learners, how they went about their learning, and how what they brought to their learning interacted with their context, I also conducted *semi-structured interviews* (see Appendix C) with each case study participant. Semi-structured interviews are loosely guided, giving participants opportunities to answer questions while also discussing unanticipated issues of importance to them (Braun and Clarke, 2013). They also allow the interviewer to probe responses (Hitchcock and Hughes, 1995), optimising the researcher's chances of understanding participants' intended meanings. Semi-structured interviews can generate rich descriptions of how students go about their learning (de

Groot, 2002) while at the same time illuminating the perspectives, beliefs, knowledge and skills students bring to bear on how they learn (Butler, 2002b). Kember (2001), for example, used interviews to understand how previous teaching impacted students' epistemological sophistication and preference for teacher or student-centred teaching, and linked this to strategy depth and university readiness. I conducted interviews in a quiet room on campus at a time convenient for them. Each roughly 45-minute interview was divided into two parts.

First, I asked *stimulated recall questions* (Kaplan *et al*, 2011; Lichtinger and Kaplan, 2015) about each work sample participants had submitted. These questions explored why they had selected particular strategies on particular occasions, how they had learned those strategies, and what other strategies they might use to achieve similar learning goals. The purpose of these questions was fourfold: to triangulate, clarify, and build upon reflection data; to develop a sense of the SRL processes underpinning students' strategy use and tease out whether any of the three theoretical perspectives underpinning this investigation was particularly relevant; to build a comprehensive picture of the situated nature of how each participant approached her learning in the DP and why she did so in that way; and to mitigate limitations associated with more open-ended self-reporting. These questions addressed Research Questions 1 and 2.

According to O'Boyle (2009), prioritising students' perspectives enables educators to more closely match students' experiences in school with what we hope their experiences will be, yet research that solicits the perspectives of international school students is rare. Because I wanted to use this investigation to advance our school's collective SRL-promoting practice, I needed to understand how students were experiencing DP teaching and learning. Thus, during the second part of each interview, I asked *open-ended questions* (de Groot, 2002; Patrick and Middleton, 2002; Lichtinger and Kaplan, 2015). These explored participants' views regarding the habits of effective learning, further addressing Research Questions 1 and 2. They also explored

participants' perspectives with regard to 'good teaching,' addressing Research Question 3. Each interview was recorded and transcribed.

Importantly, though, what is said in interviews cannot be considered a 'proxy for the observation of that phenomenon' (Freebody, 2003, p. 166). However, because I was interested in SRL as a gradually evolving approach within the two-year IB Diploma Programme, particularly how participants went about their learning during independent study, observations were unsuitable as a method. To gain a picture of participants' 'starting place' and the evolution of their SRL over the DP using an 'objective' data source, I collected four years of *school report teacher comments* for each case study participant, further addressing Research Questions 1 and 2. School report teacher comments also providing me with further insights into teaching and learning in this context.

PHASE TWO: FOCUS GROUPS

Analysing the data from the multiple case studies helped me answer the first three research questions (regarding how students' self-regulated learning developed, the self-regulatory strategies they used to facilitate their learning within the IBDP, and the teaching practices they considered 'good teaching'). However, this data did not shed light on the fourth research question (regarding the extent to which students in these groups felt it was important for their teachers to teach them ATL skills). Stake (1995) argues that it is not possible to know in advance where data will lead, thus changes can and should be made to a study's design as needed, even after data collection has begun. With this in mind, to gather data to address Question 4, I added *focus groups* to my research design. Focus groups are relatively unstructured, guided conversations between several people which can yield the perspectives of particular groups (Braun and Clarke,

2013). They can be useful in the investigation of SRL when the unit of analysis is not an individual and when a degree of comparability across cases is sought (de Groot, 2002). As such, they could help me meet my research aim of illuminating the extent to which two *groups* of students, high-achieving students and those with diagnosed learning difficulties, view explicit instruction of ATL skills as important in the IB Diploma Programme.

To answer the fourth research question, I conducted two focus groups, one with three IBDP students with learning difficulties and the other with three high-achieving IBDP students. A *semi-structured format* with *open-ended questions* (Appendix Q) explored whether and how participants were taught ATL skills and to what extent they believed it is important for their DP teachers to explicitly teach them these skills. Each focus group lasted about 45 minutes and was conducted in a quiet room on campus during a time selected by participants. Focus groups were recorded and transcribed. This phase of the investigation addressed Research Question 4.

3.4 Sample

The context of this investigation was an IB Diploma Programme within a small, non-selective all-girls international school in which teachers were learning to adopt a more student-centred approach that emphasised explicit instruction of ATL skills. Given this study's aim of exploring how DP students with learning difficulties and high-achieving students develop self-regulation, *purposeful, multiple case sampling, in which all cases met particular criteria* (Miles and Huberman, 1994), was implemented. This type of sampling was expected to illuminate the SRL of participants in two specific groups ('quintains'), as well as facilitate comparisons between them. All students who

met the sampling criteria were invited to participate, and all students who expressed interest were accepted.

Sampling criteria:

1. Participants must be enrolled in the IB Diploma Programme or taking DP course certificates (in Grade 11 or 12) *and*
2. Participants must have a diagnosed learning difficulty, involving at least one standard score of below 90 in an educational evaluation conducted by an educational psychologist, as opposed to academic challenges stemming from other causes, *or*
3. Participants must be on the Enrichment Programme register having met ‘gifted’ criteria from a range of contemporary perspectives (e.g. Gagné, 2003; Gallagher, 2003; Sternberg, 2003; Renzulli, 2012), including an achievement score within the top 5th percentile (Reid, 2011; Colangelo *et al*, 1993; Rubenstein *et al*, 2012; Schultz, 2002) on a standardised achievement test and a teacher-identified need for extension, enrichment or acceleration.

The multiple case study ‘cases’ included four students (of a possible ten) with learning difficulties (two in the first year of the DP and two in the second year), and six students (of a possible fifteen) who were on the school’s Enrichment Programme register (three in the first year of the DP and three in the second year). One focus group consisted of two Grade 11 students and one Grade 12 student with learning difficulties (again of a possible ten students), and the other consisted of three Grade 11 students on the Enrichment Programme register (again of a possible fifteen students). Table 2 (below) outlines relevant background information and identifies the research phase or phases in which they participated. All names are pseudonyms.

[Table 2: Participant background information]

Student	LD or HA	Grade	Presumption of 'typicality' based on insider knowledge	Programme participant was involved in	Research phase
Claire	LD	11	Typical	LRC (on-going)	1 and 2
Chloe	LD	11	Disconfirming	LRC (1 year)	1
Victoria	LD	11	Disconfirming	LRC (on-going)	2
Samantha	LD	12	Disconfirming	n/a	1
Hannah	LD	12	Typical	LRC (on-going)	1
Linda	LD	12	Disconfirming	LRC (on-going)	2
Sarah	HA	11	Disconfirming	EP	1 and 2
Piper	HA	11	Typical	EP	1 and 2
Annabelle	HA	11	Typical	EP	1
Julie	HA	11	Typical	EP	2
Ally	HA	12	Exceptional	EP	1
Eliza	HA	12	Exceptional	EP	1
Karen	HA	12	Disconfirming	EP	1

Due to their workload and examination schedule at the time of this investigation, not all students participated in both phases. For example, due to her end-of-year examinations when focus groups were conducted, one Grade 11 student with a learning difficulty participated in the case study phase but not the focus group phase. Two students with learning difficulties (one in Grade 11 and one in Grade 12) and one Grade 11 high-achieving student participated in the focus group phase but not the case study phase due to their workload during the case study data collection phase.

Furthermore, given the timing of the focus groups, which took place while IB Diploma examinations undertaken by students in Grade 12 were ongoing, most Grade 12 students were not available for the focus groups. Only one Grade 12 student, who had finished her IBDP examinations by the time focus groups were conducted, participated in a focus group. Altogether thirteen students, six with learning difficulties and seven high-achieving students, participated in this investigation. While small, this sample

included theoretically ‘typical’, ‘disconfirming’, and ‘exceptional’ students in each category (Miles and Huberman, 1994, p. 34), enhancing trustworthiness.

3.4 Methods of Analysis

MULTIPLE CASE STUDY PHASE

Stake (1995) defines analysis as ‘*a matter of giving meaning to first impressions as well as to final compilations*’ (p. 71) and suggests that ‘a considerable proportion of all data is impressionistic, picked up informally as the researcher first becomes acquainted with the case’ (p. 49). Although he offers general guidelines regarding how to go about this, he argues that each case study researcher needs to find the form of analysis that works best for him or her. Importantly, though, he stipulates that case study researchers need to be skilled enough to ‘[know] what leads to ‘significant’ understanding, [recognise] good sources of data, and consciously and unconsciously [test] out the veracity of their eyes and robustness of their interpretations, [which] requires sensitivity and skepticism’ (p. 50).

To learn from my data and ensure the credibility of my findings, I needed to balance my preference for a ‘pure’ qualitative investigation with my position as not only an ‘insider’ with valid interpretations, but as a novice researcher coming to grips with analysing a large volume of qualitative data in a highly complex study. To do so, I selected Miles and Huberman’s (1994) approach to content analysis as my method of analysis. This approach engages the researcher in holistic ‘progressive focusing,’ interweaving data collection and analysis simultaneously from the outset of the investigation through multiple passes of the data and multiple phases of increasingly focused data analysis. Although progressive focusing is encouraged by Stake (1995), unlike in Stake’s purely qualitative approach, content analysis utilises ‘displays’

specifically tailored to the study to ‘reduce’ qualitative into quantitative data, making it more manageable. Importantly, these displays *facilitate* analysis, helping the researcher to strengthen or, if needed, alter original interpretations and make comparisons within and across cases. They do not *replace* the original data, nor do they negate the significance of the researcher’s first impressions.

In selecting content analysis as my method of analysis, I was aware of the tension between Stake’s (2006; 1995) purely qualitative approach and the ‘positivist’ aspects of content analysis. In fact, Miles and Huberman (1994) concede their approach invites criticism from purely qualitative researchers. At the same time, I drew upon numerous studies in which influential SRL researchers juxtapose qualitative and quantitative analysis within multiple case study methodologies while investigating SRL as situated in context. For example, Anyichie *et al* (2016) utilised a range of tools in investigating how the SRL of culturally diverse learners could be promoted and combined this with in-depth qualitative analysis of the SRL-promoting practices they observed. Butler *et al* (2011) juxtaposed quantitative and qualitative analyses in their effort to take a methodological stance that aligned with their view of SRL as situated, while also enabling them to check for patterns between particular groupings of students. Hadwin *et al* (2004) also juxtaposed quantitative analysis within a qualitative cross-case study of SRL as a series of events, allowing them to compare within and across cases over time.

Instrumentation: Planning for analysis

Consistent with Stake’s (1995) position that ‘in our search for both accuracy and alternative explanations, we need discipline, we need protocols which do not depend on mere intuition to ‘get it right’ (p. 107), my most pressing concern was enhancing the

credibility of my conclusions. Miles and Huberman (1994) suggest that in multiple case studies, not only does advance preparation of instruments makes cross-case comparisons easier to accomplish, but ‘simply *thinking* in instrument terms from the outset strengthens data collection as you go’ (p. 37). Furthermore, Boekaerts and Cascallar (2006) point out that using a combination of different SRL assessment tools is necessary to understand the various aspects of students’ self-regulated learning. With this in mind, I created a range of tools to help me reduce and analyse data, validate initial interpretations, compare within and across cases, and draw trustworthy conclusions. When designing my displays, I drew upon the three theoretical SRL perspectives underpinning this investigation to ensure trustworthiness.

Furthermore, although reliability is generally not a priority within qualitative research, it is an important element of content analysis (Miles and Huberman, 1994). Moreover, Cascallar *et al* (2006) argue that ‘under whichever methodology to establish it, the need for evidence of reliability of a measure is indispensable’ (p. 298). I therefore engaged in intra-rater reliability checking during analysis and scrutinised and revised displays and/or decision rules when lack of clarity or inconsistencies arose (See Familiarisation Phases 1-3, pp. 73-75). Throughout analysis I also drew constant comparisons between the original data sets and the various displays, recursively using both to draw and confirm my conclusions. All tools utilised rating scales between 1-4 to facilitate alignment with the social cognitive SRL levels of competence (Schunk and Zimmerman, 2007; Usher and Schunk, 2018; White and DiBenedetto, 2018) described in Chapter 2:

- 1 – observation
- 2 – emulation
- 3 – self-control
- 4 – self-regulation

Phase 1 tools developed prior to data collection:

1. I developed a ***Start List of Codes*** (see Appendix A), generating categories and codes from the literature review, conceptual map, and research questions. Given the integrated theoretical approach utilised in this investigation, this Start List was extensive, including categories and codes from each of the relevant theoretical perspectives and conceptually related fields, the fields of gifted/high-achievement and learning difficulties, and SRL-promoting pedagogies. During coding many codes were discarded while other codes, not included in the Start List, emerged from the data (Miles and Huberman, 1994). This list was revised during each phase of analysis.
2. Drawing on Zimmerman's (1990) definition of self-regulated learning strategies as '*actions and processes directed at acquisition of information of skills that involve agency, purpose, and instrumentality perceptions by learners*' (p. 5), I created a ***Reflection Form*** (see Appendix B) which contained ***open-ended prompts*** to illuminate the extent to which participants' strategy use reflected this definition as well as the social cognitive phases of SRL. This form was successfully piloted with a Grade 9 student with learning difficulties.
3. In this investigation I utilised a ***semi-structured interview schedule with stimulated recall and open-ended questions*** (see Appendix C). Question development was an iterative process and questions were clarified for students during the interview on the rare occasion that confusion arose. The interview schedule was successfully piloted with a Grade 9 student with learning difficulties.

Phase 1 tools developed after data collection to assist analysis

Given the huge amount of qualitative data generated by each case, I first created a *Summary Contact Form* (see Appendix D) to help me familiarise myself with, organise and begin to make sense of the data, prior to coding and more in-depth analysis. I used it to summarise students' work samples, reflections, and interview data prior to coding (Miles and Huberman, 1994), without drawing any conclusions.

I also developed an *Interview Within-Case Display* (see Appendix E). I used this after initial coding to further analyse interview data and better understand how 'what the student brings' interacted with contextual influences to enhance or inhibit the development of various self-regulatory processes, from a situated perspective (Butler and Cartier, 2018). This display was divided into three sections. The first, '*What the student brings...*' was underpinned by my review of literature. The second, '*Contextual influences,*' emerged from the SRL literature and my insider knowledge of the local context. The third, '*Self-regulated learning*' included a range of self-regulatory processes identified in the literature.

I developed a *Reflection Form Within-Case Display* (see Appendix F) to help me analyse the reflections that students submitted in relation to Zimmerman's (1990) definition of self-regulated learning strategies. Drawing on social cognitive theory (Zimmerman, 2000), this sheet was divided into three categories (*forethought, performance, and reflection*), each of which was further subdivided to help me pinpoint whether any particular aspect emerged as particularly influential on students' SRL.

Drawing on Stålné *et al* (2016), I developed a *Work Samples Evaluation Sheet* (see Appendix G) to help me evaluate, from an information processing perspective, the effectiveness of the self-regulated learning strategies students applied to their learning. Three fundamental aspects of strategy effectiveness were evaluated using this sheet, each of which was broken down into sub-categories. '**Cognitive strategies**' were

defined operationally as *strategies that were ‘aimed at the straightforward cognitive goal of simply improving your knowledge’* (Flavell, 1979, p. 909), To evaluate **cognitive awareness**, I drew upon Winne’s (2018) SMART cognitive processes and considered whether strategy use was appropriate for the task and stated learning goal and demonstrated evidence of task complexity (Pieschl *et al*, 2012; Pieschl *et al*, 2014) and subject-specific understanding and elaboration (Donker *et al*, 2014).

‘**Metacognitive strategies**’ were operationalised as those strategies aimed at *monitoring cognitive progress* (Flavell, 1979). To evaluate **metacognitive awareness**, I drew upon Bjork and Bjork’s (2011) work regarding desirable difficulties, McCabe’s (2011) work regarding metacognitive illusions of competence, and Winne’s perspective regarding students’ awareness of their strengths and weaknesses and metacognitive monitoring. ‘Epistemic awareness was operationalised as *‘attitudes about the nature of knowledge and how it should be acquired and evaluated’* (Felder and Brent, 2005, p. 57). To evaluate **epistemic awareness**, I drew upon the work of Muis and Singh (2018) regarding strategy depth and standards for ‘knowing’, Flum and Kaplan’s (2006) work regarding awareness of the uncertainty and ambiguity of complex knowledge, Pieschl *et al*’s (2014) work regarding the variability of knowledge, and King and Kitchener’s (2004) work regarding the reflexivity of thinking.

Phase 1 tools developed during analysis, to further explore and clarify initial interpretations

1. I created the *Development of SRL Within-Case Display* (see Appendix H), drawing on the literature to identify relevant SRL phases: ‘what the student brings,’ personal goals, planning, enacting strategies, adjusting, and interpreting expectations. At each phase students were rated at one of social cognitive

theory's developmental levels using a rating scale between 1-4. These were averaged to determine a 'holistic' SRL developmental level.

2. I created the *School Reports Within-Case Display* (see Appendix I) to chart each participant's SRL, as indicated by teachers' comments on their school reports for each reporting period over four years. This display includes the decision rules utilised.
3. I created the *What the Student Brings Across-Case Pattern Display* (see Appendix J) to compare aspects of what each student brought to her learning that had emerged from the data, such as interest, causal attributions, and proactivity. This display includes the decision rules utilised.
4. I created the *Type of Strategies Described Across-Case Pattern Display* (see Appendix K) to compare the specific strategies described by students with learning difficulties and high-achieving students in Grades 11 and 12. These included rereading, completing practice problems, making flashcards, creating essay plans, etc.
5. I created the *Type of Work Samples Submitted Across-Case Pattern Display* (see Appendix L) to compare the strategies submitted by students with learning difficulties and high-achieving students in Grades 11 and 12.
6. I created the *Cognitive, Metacognitive, and Epistemic Awareness Across-Case Pattern Display* (see Appendix M) to help me compare the cognitive, metacognitive and epistemic awareness demonstrated by participants in each quintain and grade level.
7. I created the *Orientation Goals Across-Case Pattern Display* (see Appendix N) to help me determine whether any particular goal orientation (mastery approach, performance approach, mixed mastery and performance approach, etc) emerged as most beneficial to students' SRL in this investigation.

8. I created the *Development of SRL Across-Case Pattern Display* (see Appendix O) to provide a visual representation comparing the social cognitive developmental SRL levels of students in the different quintains and grade levels.
9. I created the *Preferred Teaching Approaches and Strategies Across-Case Pattern Display* (see Appendix P) to compare the preferred teaching approaches and strategies of students in different quintains and grade levels.
10. I used the School Reports Within-Case Displays to create the *School Reports Across-Case Pattern Display* (see Appendix S) to compare the development of SRL over time for students in each quintain.

Definitions applied during coding

Definitions of key concepts operationalised during coding were derived from the literature review. The terms ‘**approaches to teaching**’ and ‘**teaching approaches**’ were operationalised as generic terms referring to teachers’ adoption of either a ‘teacher focus,’ emphasising ‘delivery’ of content through methods such as lectures, or a ‘student focus’ in which learning is emphasised through methods promoting active student engagement, collaboration, and formative assessment (Gibbs and Coffey, 2004; Biggs, 2012). The term ‘**Approaches to Learning skills**’ referred to the DP curriculum’s (2016) ATL skills (Communication, Collaboration, Reflection, Self-management, Research, Thinking, and Affective skills). These were coded as ATL skills only when referenced as explicitly taught as part of the DP curriculum. When coding SRL strategies I used Zimmerman’s (1990) definition of ‘**self-regulated learning strategies**’ as ‘*actions and processes directed at acquisition of information of skills that involve agency, purpose, and instrumentality perceptions by learners*’ (p. 5).

During coding I drew on Flavell's (1979) definitions for most of the key concepts related to metacognition. The term '**metacognition**' was operationalised as a generic term referring to participants' *'knowledge and cognition about cognitive phenomena'* (p. 906). The term '**cognitive strategies**' was operationalised as a generic term referring to strategies *'aimed at the straightforward cognitive goal of simply improving your knowledge'* (p. 909). Also following Flavell (1979), the term '**metacognitive strategies**' was operationalised as a generic term referring to strategies aimed at monitoring cognitive progress. The term '**epistemic awareness**' was operationalised as a generic term referring to students' *'attitudes about the nature of knowledge and how it should be acquired and evaluated'* (Felder and Brent, 2005, p. 57).

For coding purposes, a range of definitions related to strategy and processing depth were also drawn upon. The term '**shallow processing**' was operationalised as a generic term referring to learning focused on memorising rote facts (Dinmore and Alexander, 2012; Baeten *et al*, 2010). The term '**surface strategies**' was operationalised as a generic term referring to rote strategies promoting memorisation, such as rehearsing flashcards (Felder and Brent, 2005; Heikkilä and Lonka, 2006). The term '**deep processing**' was operationalised as a generic term referring to learning focused on meaning (Pieschl *et al*, 2014; Marton and Säljö, 1976; Dinmore and Alexander, 2012; Baeten *et al*, 2010). The term '**deep learning**' was operationalised as a generic term referring to the development of rigorous content knowledge, conceptual understanding, sophisticated task-specific skills, and long-term retention (IB, 2014a; Baeten *et al*, 2010). The term '**deep strategies**' was operationalised as a generic term referring to strategies focused on meaning and in-depth understanding, such as those that involving analysis, evaluation, application, elaboration, and making connections between new and previously learned concepts (Bjork *et al*, 2013; Baeten *et al*, 2010). Importantly, strategy and processing depth was not operationalised as dichotomies. Instead, 'effectiveness' of

strategy use was evaluated in relation to the appropriateness of a particular strategy to the demands of the task, with strategy and processing depth being aspects of this.

In terms of goal orientations, the term '**approach orientation**' was operationalised as a generic term referring to goals focusing on success, and the term '**avoidance orientation**' as a generic term referring to goals focused on avoiding failure (Pintrich, 2003; Sideridis, 2006; Kaplan *et al*, 2011). The term '**mastery approach goal orientation**' was operationalised as a generic term referring to self-set goals, underpinned by intrinsic interest, focused on mastering knowledge, skills, and processes (Zimmerman, 2002; Pintrich, 2003). The term '**performance approach goal orientation**' was operationalised as a generic term referring to attaining good grades and doing well in comparison to others (Zimmerman, 2002; Pintrich, 2003). The term '**mastery by performance orientation**' (Sideridis (2006, p. 13) was operationalised as a generic term referring to the multiplicative use of performance and mastery goals in order to master knowledge and skills in order to achieve at high levels using DP criteria.

Familiarisation

Taking the stance that 'understanding comes in layers' (Miles and Huberman, 1994, p. 62), analysis took place in multiple phases, each informed by an integrated theoretical lens. While cautioning against drawing premature conclusions, Miles and Huberman (1994) recommend 'interweaving data collection and analysis' (p. 50) from the start of the investigation. The purpose of the first three passes of the data was familiarisation.

Familiarisation phase 1:

Immediately following each interview, I briefly summarised my initial thoughts. After collecting all case study data for each participant, I created a 'Summary Contact Form' to summarise my initial perceptions of the data for each case. Next, I used the Start List of Codes to code six of the ten interview transcripts, adding new codes as needed and deleting irrelevant codes. Coding was a painstaking process during which I simultaneously attended to my own impressions (Stake, 1995; 2013) as an 'insider,' as well as my impressions as an 'outsider,' drawing on the definitions and theoretical descriptions derived during the literature review. I used coded data to complete a Reflection Form Within-Case Display, an Interview Within-Case Display, and a Work Samples Evaluation Sheet for each of the six participants.

Familiarisation phase 2: Revising decision rules

After familiarising myself with the data for six participants, I scrutinised completed displays. During this scrutiny I noted that the ratings I had applied using the Work Samples Evaluation Sheets made the quality of participants' work samples appear more similar than the samples themselves actually appeared, particularly in light of accompanying reflection and interview data. I revised the decision rules and used the updated decision rules to build displays for the other four cases.

Familiarisation phase 3: Scrutiny and revision

Stålne *et al* (2016) ask 'how should one distinguish the subtle differences between those outcomes that seem to be at the same level but are still clearly different?' (p. 1034). After coding and display-building for the final four cases, I scrutinised the displays for all ten cases and determined that my Work Samples Evaluation Sheet ratings still made students' work samples appear more similar than they actually were. To more accurately distinguish between samples of varying quality, I reduced the grain

size of each category on the Work Samples Evaluation Sheet, dividing them into smaller sub-categories while keeping true to the theoretical foundations underpinning each (Stålne *et al*, 2016). For example, I increased the number of ‘Cognitive Awareness’ sub-categories from three to six. I also made minor changes to the Interview and Reflection Form With-Case displays.

Next, I used the coded interview transcripts to revise the Start List of Codes, filling it in with codes generated by the data, extending codes that already existed, surfacing new categories of codes, and bridging codes when two or more codes had been used but only one was required (Miles and Huberman, 1994). In doing so, I slightly reduced the social cognitive element of the Start List and increased the information processing and situated elements. This exercise further illuminated the theoretically integrated nature of SRL that emerged from the data.

Data analysis

Data analysis phase 1: Second-round coding, display-building, and intra-rater reliability checking

Stake (1995) argues that, to establish credibility, case study researchers need to engage in protocols that enable them to ‘gain the needed confirmation, to increase credence in the interpretation, to demonstrate commonality of an assertion’ (p. 112). He advocates member-checking, which worked well for me during my IFS investigation (Forrest, 2017; Forrest, 2018). Due to the timing of this investigation, though, participants were unavailable for member-checking. Thus, I decided to follow Miles and Huberman’s (1994) guidance with regard to intra-rater reliability checking. Although not consistent with Stake’s (1995; 2006) purely qualitative approach to analysis, intra-rater reliability checking is consistent with the more ‘juxtaposed’ qualitative-quantitative

approach to analysis often taken by SRL case study researchers. It is also consistent with content analysis, my chosen method of analysis. Most importantly, intra-rater reliability checking provided me with a high degree of confidence in my qualitative analysis. As a ‘novice’ researcher, this was crucial.

This phase of analysis began several weeks after familiarisation concluded and lasted several weeks. During this phase I ‘blind’ recoded all interview transcripts using the revised Start List of Codes and built new displays for each case. I then moderated the resultant ratings with those generated by previous displays by conducting intra-rater reliability checks for each of the displays, building new displays and moderating until holistic ratings had achieved 95% agreement. Table 3 (below) demonstrates the number of passes moderation required for the three within-case displays central to this phase of analysis.

[Table 3: Moderation of SRL displays]

	Under 95% Agreement (first moderation)	Under 95% Agreement (second moderation)	Under 95% Agreement (third moderation)
Work Samples Evaluation Sheets n=50	n=3	n=0	n/a
Interview Within-Case Displays n=10	n=7	n=2	n=0
Reflection Within-Case Displays n=10	n=4	n=0	n/a

Data analysis phase 2: Across-Case Display Building

During this phase of analysis, I tried to understand what might explain unanticipated similarities and differences in students’ SRL processes and strategies that emerged from the data. To do so, I created new displays as needed. For example, as cognitive, metacognitive, and epistemic awareness appeared to play a more significant role in the quality of students’ strategy use than I had initially anticipated, I created the ‘Cognitive, Metacognitive, and Epistemic Awareness Across-Case Display’ (see Appendix M) to compare information processing levels across cases. To compare the strategies used by students with learning difficulties and high-achieving students, and to

determine if DP ‘year’ (Grade 11 or 12) made a difference, I created the ‘Types of Strategies Submitted’ and ‘Types of Strategies Described’ across-case pattern displays, distinguishing both between quintain and year group (see Appendices K and L). To compare what individual students brought to the learning context, I created the ‘What the Student Brings Across-Case Pattern Display’ (see Appendix J). For each set of displays, I engaged in blind intra-rating reliability checking, building and moderating displays until 95% agreement had been achieved.

Data analysis phase 3: Digging deeper into goal orientation

After engaging in the above analysis, I determined that motivation, particularly goal orientation, seemed more important to how participants’ self-regulation had developed than I had interpreted it to be during initial coding. I wondered if ‘data overload’ had initially caused me to underestimate the impact of goal orientation on participants’ self-regulation. During this phase I coded interview transcripts only for goal orientation, triangulated this analysis with reflection data, and created a ‘Goal Orientation Across-Case Pattern Display’ (see Appendix N) to help me compare across cases.

Data analysis phase 4: Beginning to consider the bigger picture

During this phase, I aimed to understand how particular aspects fit together to enhance or inhibit participants’ self-regulated learning within the IB Diploma Programme. I reviewed the data and the various displays and built a ‘Development of SRL Within-Case Display’ (see Appendix H) for each case, using the levels of competence described by a number of social cognitive researchers (Schunk and Zimmerman, 2007; Usher and Schunk, 2018; White and Di Benedetto, 2018) to rate participants’ development at each phase of SRL.

Next, I averaged these ratings to calculate a ‘holistic’ SRL level of competence for each participant. I then used participants’ levels of competence to build a ‘Development of SRL Across-Case Pattern Display’ (see Appendix O) to compare the self-regulated learning of high-achieving participants and those with learning difficulties, distinguishing between those in Grade 11 and in Grade 12.

Data analysis phase 5: Rating of school report teacher comments

In order to enhance validity, ‘all instruments based on posterior self-descriptions of performance and reasoning [should] be validated ultimately against students’ actual performance in naturalistic settings’ (Zimmerman and Pons, 1986, p. 626). Each teacher’s comments on each participant’s most recent school report were rated holistically from 1 to 4. A rating of 1 indicated that the teacher’s comments reflected that he or she was highly concerned about the student’s approach. A rating of 2 indicated that the teacher was concerned about the student’s approach but included some positive comments. A rating of 3 indicated that, overall, the teacher felt that the student’s approach was largely effective, but some improvements were suggested. A rating of 4 indicated that the teacher was highly impressed with the student’s approach. These were averaged and compared to the holistic SRL ratings I had calculated using the Development of SRL Within-Case Display. Holistic ratings were then calculated by finding the average SRL rating for each measure. Table 4 (below) summarises the holistic SRL ratings across measures.

Data analysis phase 6: SRL development over time

During this phase of analysis, four years of school report teacher comments were analysed to determine students’ ‘starting place’ and how their SRL had evolved within the IB Diploma Programme. Teachers’ comments for each reporting period during the four years since the school’s ATL CPD programme had commenced were

[Table 4: Comparison of holistic SRL ratings across displays]

	Interview Within-Case Display Ratings	Reflection Form Within-Case Display Holistic Rating	Development of SRL Within-Case Display Holistic Rating	Most Recent School Report Teacher Comments Holistic Rating	Work Samples Holistic Score	Primary Goal Orientation
Claire	SRL: 2.2	2.1	2.1	2.3	3.1	Mixed MAP, PAP, PAV, MAV, task completion
Chloe	SRL: 3.1	3.3	3.5	3.6	3.7	Performance approach
Hannah	SRL: 2.6	2.2	2.9	2.9	3.4	Mastery approach
Samantha	SRL: 4.0	3.8	4.0	3.8	4.0	Mastery by performance
Sarah	SRL: 3.3	3.4	3.4	3.7	4.0	Mixed MAP, PAP, PAV, MAV
Piper	SRL: 3.6	3.4	3.7	3.3	3.7	Performance approach
Annabelle	SRL: 4.0	3.7	4.0	3.9	4.0	Mastery by performance
Eliza	SRL: 4.0	3.7	4.0	3.8	4.0	Mastery by performance
Ally	SRL: 4.0	3.7	4.0	3.9	4.0	Mastery by performance
Karen	SRL: 3.47	3.4	3.7	3.3	3.8	Performance approach

analysed holistically. If all teachers within a given reporting period had commented on high levels of engagement, effort, strategy use and other SRL indicators, a rating of ‘4’ was applied. If most teacher comments reflected high levels of SRL, but some improvement was needed in others, or if improvement was required in multiple subjects, a rating of ‘2’ was applied. If, overall, teacher comments indicated poor levels of SRL in multiple subjects, a rating of ‘1’ was applied.

The ratings attributed to teacher’s comments within each reporting period were plotted on a School Reports Within-Case Display (Appendix I). In order to illuminate patterns of SRL development over time and make comparisons across the two groups, I generated School Reports Across-Case Pattern Displays (see Appendix S) for students with learning difficulties and high-achieving students by plotting their School Reports Within-Case Display ratings on graphs.

Data analysis phase 7: Big picture reliability checking

In-depth reliability checking was vital to my confidence that I was forming well-founded conclusions. As the threshold for inter-rater reliability checking set by Miles and Huberman (1994) is 85%, I set an 85% threshold for within-case, across-instrument reliability-checking. This was achieved by calculating the degree difference between the highest and lowest holistic SRL ratings indicated by each participant's within-case displays (see Table 3) and moderating any that did not achieve at least 85% agreement. The data for four of the ten participants initially did not achieve at least 85% alignment across measures (however, one of these achieved 84% and the other achieved 83%). After moderation, eight had achieved the 85% threshold (see Table 5, below). A satisfactory explanation for the two confounding results was sought and obtained.

[Table 5: Moderation across measures]

	Under 85% Agreement n=10	Under 85% agreement (first moderation) n=4	Under 85% Agreement (second moderation) n=2
Across-measure moderation	4	2	2

Data analysis phase 8: Beginning to think about teaching

After engaging in multiple layers of data analysis to better understand how participants' SRL had evolved in this particular DP context, I turned my attention to their perspectives with regard to teaching in order to illuminate how what students brought to their learning interacted with context and whether their views regarding 'good teaching' were more closely aligned with the SRL literature and intended IB pedagogy or with the perspectives their teachers attributed to them (Forrest, 2017).

To make analysis more efficient and effective, I distilled from each interview all excerpts about teaching and incorporated these into a single document, distinguishing between excerpts generated by participants with learning difficulties and those generated by high-achieving participants, and distinguishing between participants in Grade 11 and

those in Grade 12. I then engaged in preliminary coding of these excerpts. After preliminary coding, I built a 'Preferred Teaching Approaches and Strategies Across-Case Display' (see Appendix P). This data revealed strong views regarding student-centred teaching but did not illuminate participants' views about explicit instruction of ATL skills.

Data analysis phase 9: Reliability checking

I engaged in intra-rater reliability checking to ensure the reliability of my instrument and findings by recoding teaching excerpts. As my instrument did not sufficiently capture the views that emerged from the data, I created a new display that better aligned with the data and moderated until 95% agreement was achieved (see Table 6, p. 80).

PHASE TWO: FOCUS GROUPS

Instrumentation: Planning for analysis

Phase 2 tools developed prior to data collection: To further address Research Question 3 and address Research Question 4, I developed a *semi-structured focus group schedule* comprised of *open-ended questions* (see Appendix Q).

Phase 2 tools developed prior to analysis: I designed the *Importance of Teaching ATL Across-Case Pattern Display* (see Appendix R) to help answer Research Question 4. This display utilised a simple + or – symbol to indicate whether or not each of the focus groups, divided by grade level, considered it important for teachers to explicitly teach particular ATL skills (Communication, Collaboration, Thinking, Reflection, Research, Affective skills, and Organisation).

Familiarisation

This phase of analysis was similar to the familiarisation phase of interview analysis. Preliminary coding was followed by building the ‘Importance of Teaching ATL Across-Case Display,’ which utilised a simple + or – system of analysing whether or not participants thought it was important for their teachers to teach them a particular ATL skill (see Appendix R). Analysis of this data was relatively straightforward as participants’ views were clear and largely aligned between both focus groups. Thus, familiarisation required only a single pass of the data.

Focus group recoding and blind intra-rater reliability checking

To maximise the reliability of my instrument and findings I engaged in a similar process of intra-rater reliability checking to that which I had engaged in when analysing interview data. This involved blind recoding focus group transcripts, building a new display and moderating until 95% agreement was achieved. As demonstrated in Table 6, 100% agreement was achieved during the second moderation.

[Table 6: Moderation of Preferred Teaching Approach and The Importance of Teaching ATL displays]

	% Agreement (first moderation)	% Agreement (second moderation)
Preferred Teaching Approaches and Strategies Display	86%	100% (new instrument)
The Importance of Teaching ATL Skills	90%	100%

‘Writing is thinking’ (Miles and Huberman, 1994, p. 101)

Throughout all phases of data collection and analysis I engaged in on-going memo writing (Miles and Huberman, 1994) to help me clarify and keep track of my

thoughts, observations, and ideas. This was an informal and unstructured process that involved post-it notes, emailing myself, annotating books and articles, and taking digital notes on whatever device I had to hand. Data analysis continued throughout months of drafting and refining the report. Throughout the entire process I frequently re-visited the original data sets, reviewed the displays I had built and compared my own findings with the literature.

3.6 Reflexivity

As the school's Director of Specialist Programmes, I had strongly bought into the IB's (IB 2016; IB 2014b) view that student-centred teaching and explicit instruction of ATL skills (Communication, Collaboration, Reflection, Self-management, Research, Thinking, Affective, and Transfer skills) have great potential to support students of all abilities in taking ownership of their own learning. As this was something many students at my school struggled with, I had invested a great deal of professional energy into 'cultural transformation' (Forrest, 2017; Forrest, 2018). In the 3 years prior to the commencement of this investigation, I had designed and led CPD sessions on topics such as Collaborative Learning, Cognitive Apprenticeship, Teaching for SRL, Structured Inquiry, Assessment for Learning, and Problem-Based Learning. The aim of this CPD programme was to support teachers in developing their repertoire of SRL-promoting practices. However, my Institution Focused Study investigation (Forrest, 2017) indicated that, although DP teachers now tended to take a 'process-focused' approach with regards to performance tasks, a more 'teacher-focused' approach with regard to content area teaching continued to be prevalent.

I had also worked hard, through the LRC and Enrichment programmes I designed and coordinated, to develop the SRL of students with learning difficulties and high-achievers, working directly with them towards this aim. Basing the LRC programme on

the Self-Regulation Empowerment Programme (SREP) described by Cleary and Platten (2013) and Cleary and Zimmerman (2004), I supported students' confidence, motivation, goal-setting, strategy use, effort, self-monitoring, self-evaluation and reflection, using their own coursework and learning goals as the foundation for instruction. SRL strategies were taught through a process of modelling, scaffolding, coaching and fading with feedback. After instruction, students practiced taught strategies during their own independent study.

Basing the EP on Renzuli's (2012) Three-Ring Conception of Giftedness and Enrichment Triad Model, I designed this programme to ensure that involved students were sufficiently challenged. I also aimed to help students improve self-identified aspects of their SRL in order to prepare for the demands of the DP. Involvement in this programme primarily included enrichment, extension, and differentiated classroom instruction and annual meetings involving the students, their parents, and me.

As a qualitative researcher with an 'insider' status, it was not possible, nor appropriate, for me to take the 'objective' perspective highly valued in the 'positivist' research tradition. In fact, teachers' insider knowledge is an important aspect of qualitative educational research (Twigg, 2010). Additionally, and with respect to multiple case study research in particular, Stake (2006) argues that multiple case study researchers' sense of the significance of what emerges from data relies heavily on their own previous experience. Thus, my 'prolonged engagement' (Shenton, 2004, p. 65) in this context, particularly in my role as Director of Specialist Programmes, was an asset in terms of the unique perspective I brought to bear on methodological design, methods used, and data analysis.

Nevertheless, adopting roles as both 'insider' and 'outsider' necessitated a highly transparent and reflexive approach (Hitchcock and Hughes, 1995), and my status as a novice researcher made such an approach even more critical. For my findings to

advance my own practice and ultimately support the advancement of practice at my school, I needed to ‘minimise misrepresentations and misunderstanding’ (Stake, 1995, p. 109) to the greatest extent possible. The credibility of findings in multiple case research rely heavily on ‘strong conceptual interests, a multidisciplinary approach, and good ‘investigative skills’’ (Miles and Huberman, 1994, p. 38). This investigation was underpinned by clearly defined conceptual interests, a rigorous, multiple case study methodology, methods well-aligned to its purposes, and a highly forensic investigative approach throughout data analysis. My efforts to enhance credibility are detailed below.

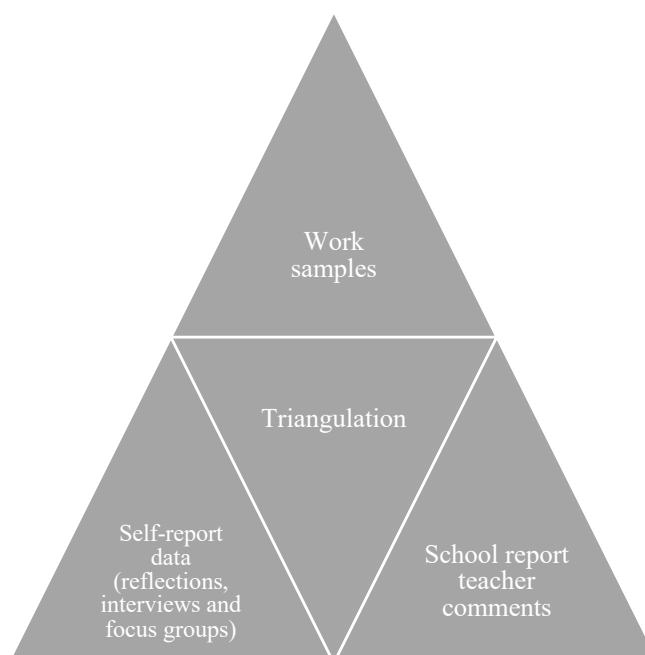
Credibility

Stake (2006) suggests that multiple case study research tends to be so complex that it is rarely conducted by individual researchers. Even within a simpler study, it is very easy to misinterpret open-ended qualitative data (Matthews and Kitchen, 2007). Although the data generated by this investigation was rich, varied, and illuminating, offering powerful insights into the SRL of participants, its volume and complexity had the potential to prove overwhelming, threatening the quality of my analysis and raising questions about the trustworthiness of my findings.

In qualitative multiple case study research, *triangulation* is an essential aspect of ensuring credibility (Stake, 2006). One way of triangulating data is through triangulation of methods, compensating for the limitations of individual methods (Kaplan *et al*, 2011; Patrick and Middleton, 2002; Wolters and Won, 2018; Freebody, 2003; Torrance, 2012). Methods triangulation was achieved through the use of work samples, reflections, interviews, school report teacher comments, and focus groups (see Figure 1, below), each of which were carefully scrutinised through multiple passes of the data and multiple phases of familiarisation and analysis, ensuring I stayed true to the

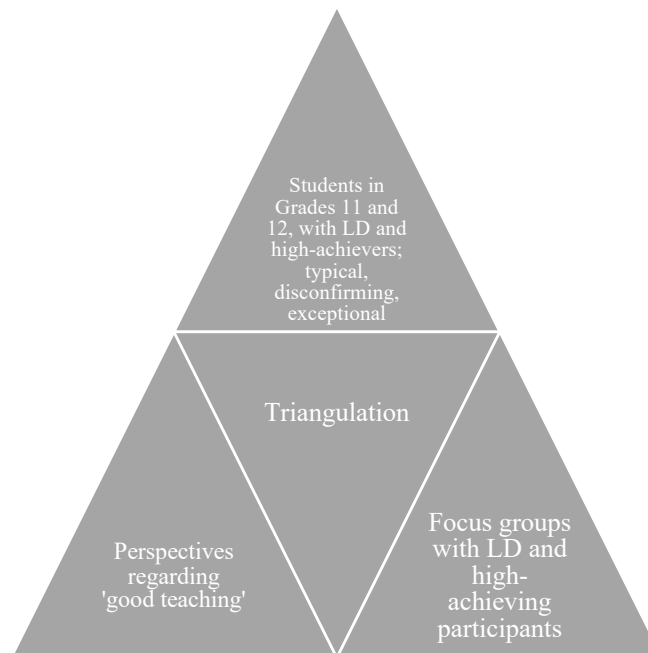
‘bigger picture.’ Finally, displays were utilised to help clarify, not drive or replace, progressive focusing through multiple passes of the data

[**Figure 1:** Illustration of methods triangulation]



Data source triangulation also increases credibility (Stake, 1995; 2006). This was achieved in a range of ways. For example, purposeful sampling for the case study phase ensured the data I gathered reflected a range of perspectives (LD, high-achieving, Grade 11, Grade 12, typical, disconfirming, exceptional). During the focus group phase, triangulation was achieved by holding two focus groups, one with IBDP students with learning difficulties and the other with high-achieving IBDP students, allowing for comparison of responses. Moreover, focus group data was triangulated with the perspectives regarding ‘good teaching’ that emerged from case study data (see Figure 2, below). Credibility was also enhanced through a semi-structured interview format that

[Figure 2: Illustration of data source triangulation]



ensured that participants understood the questions posed and I understood participants' intended meanings (Patrick and Middleton, 2002). Designing theoretically grounded instruments in response to this investigation's specific aims and context (Cascallar *et al*, 2006), rather than using generic published instruments (Patrick and Middleton, 2002), also enhanced credibility. Other steps I took to increase credibility were triangulating between measures through across-measure intra-rater reliability checking; providing comprehensive across- and within-case comparisons (Freebody, 2003; Somekh and Lewin, 2011); describing confirming and disconfirming cases (Butler, 2002b; Stake, 1995); using work samples as a 'memory trigger' accompanying stimulated recall questions (Kaplan *et al*, 2011) and; following up surprises (Miles and Huberman, 1994).

External validity, or generalisation, is potentially achievable in qualitative research through thick descriptions allowing readers to compare their own situations to the phenomenon described (Shenton, 2004). Importantly, this is a matter of the reader's

personal judgement, rather than ‘asserted’ by the researcher (Bassey, 2003). An emphasis on participants’ own words and images of students’ work may invite such judgements, although this was not a priority.

Reliability

‘Reliability’ is a concern from a positivist research tradition and does not feature in Stake’s (1995; 2006) purely qualitative approach. Nevertheless, as a novice researcher, taking steps to ensure reliability increased my own confidence in my findings. I also hoped that such steps would increase my colleagues’ confidence in my findings, an important consideration given my role at the school and this investigation’s purpose of advancing our collective practice. I therefore took several steps to ensure reliability: 1) piloting methods with a Grade 9 student with diagnosed learning difficulties; 2) offering detailed descriptions of methods of data collection and analysis and including instruments as appendices, allowing this investigation to serve as a ‘prototype model’ (Shenton, 2004, p. 71); 3) using SRL ‘critical indicators’ to develop displays and refining them through progressive focusing of the data, and 4) engaging in blind intra-rater reliability checking and moderating until 95% agreement was achieved within measures and 85% agreement across measures.

3.7 Ethical considerations

Ethical approval was sought and granted for this investigation. Given my relationship with prospective participants, the Ethics Committee recommended that I consider having a neutral person, such as an administrator, invite students to participate

in this study. I therefore asked students' advisors (form tutors), to distribute invitations. Even still, I was aware that many participants had been, and some were still, involved in programmes for which I was responsible, creating a power imbalance (Somekh and Lewin, 2011; Braun and Clarke, 2013). Also, although their learning difficulties were mild enough for them to be enrolled in a rigorous academic programme and to aspire to university study, some in in top-tier universities, students with LD are considered a vulnerable group (Braun and Clarke, 2013). To mitigate issues such as these, the invitations to participate included an Information Sheet which made clear the voluntary nature of participation and offered students the opportunity to withdraw, as long as they did so within two months of participating, and stated clearly that there would be no negative repercussions for not participating or for withdrawing. The Consent Form, included with the invitations, reiterated these points. Participants' parents were also provided Information Sheets.

Furthermore, during interviews and focus groups, great care was taken to establish a comfortable, relaxing tone. Conversations were loosely guided by interview and focus group schedules but were also driven by participants' own priorities. Finally, participants were aware that pseudonyms would be used throughout the study to ensure none of the data could be traced back to any individual. It was also made clear that confidentiality was an important aspect of the ethics of the investigation (Somekh and Lewin, 2011; Braun and Clarke, 2013).

My school provided a large percentage (50% during my first year, 60% during my second year, and 70% thereafter) of the funding for my doctoral tuition, motivated by an interest in better understanding where improvements to teaching and learning can be made. As above, it is expected that the efforts made to enhance reliability and validity would also mitigate any perceived bias stemming from this financial support.

Chapter 4: Findings and Analysis

In the first part of this chapter, I present the findings and analysis of the multiple case study phase of this investigation. This analysis ‘followed the data,’ integrating theoretical explanations rather than privileging a particular stance, thus preserving the complexity of SRL. Because this theoretical complexity made concise reporting a challenge, particularly when combined with the large volume of open-ended, qualitative data generated by the case studies, illustrative examples, typically including relatively lower and higher self-regulators in each quintain, are drawn upon to illuminate the findings in relation to each research question. In the latter part of this chapter, I present the findings and analysis of focus group data.

The structure of this chapter is guided by the research questions posed, and each section begins with a brief summary. In relation to Research Question 1, I draw out the analysis using eight illustrative examples, illuminating how an integrated theoretical perspective deepened my understanding of how participants developed their self-regulation within the IB Diploma Programme. In doing so, I draw upon social cognitive SRL developmental levels discussed previously (observation (1), emulation (2), self-control (3) and self-regulation (4)) to make distinctions between lower and higher self-regulators within each quintain (high-achieving IBDP students and those with learning difficulties). However, I do not argue a perfect alignment between these participants’ SRL levels and those described by social cognitive theorists. Rather, the levels attributed to participants are used here primarily to form a basis for comparison within and between quintains. Overall, though, in response to Research Question 1, the ‘Observation’ level would have been attributed if a participant indicated that she was taught strategies but did not use them; the ‘Emulation’ level was attributed when participants used strategies as they perceived them to have been taught, but ineffectively; the ‘Self-Control’ level was attributed when participants used strategies independently

and, for the most part, consistently and effectively, and; the ‘Self-Regulated’ level was attributed when participants used strategies highly independently and effectively, demonstrating full ‘ownership’ over their strategy implementation.

In relation to Research Question 2, my evaluations of the work samples of three ‘illustrative’ participants, a relatively lower self-regulator within the learning difficulties quintain, a higher self-regulator within the learning difficulties quintain, and a higher self-regulator in the high-achieving quintain, are discussed. The Work Samples Evaluation Sheet (see Appendix G) helped me evaluate whether the cognitive, metacognitive, and epistemic awareness as reflected by participants’ work samples was ‘limited,’ ‘adequate,’ ‘substantial,’ or ‘excellent.’ In relation to Research Question 3, participants’ perspectives regarding three teaching practices that consistently emerged from the data as ‘good teaching’ are analysed. In discussing my analysis of participants’ perspectives regarding Research Question 4, the ATL skills themselves guide the structure of the discussion. I now turn to a discussion of the findings in relation to the multiple case study phase of this investigation.

PHASE ONE, MULTIPLE CASE STUDY ANALYSIS

Research Question 1: In this context, how do high-achieving IB Diploma Programme students and those with diagnosed learning difficulties develop self-regulated learning?

Summary

In line with the literature, two case study participants with learning difficulties (those who were still receiving support) had the poorest levels of self-regulation, with

Claire, in Grade 11, rated at the 'Emulation' level, and Hannah, in Grade 12, rated between the 'Emulation' and 'Self-control' levels. Moreover, all high-achieving participants were rated as 'Self-regulated' or between the 'Self-control' and 'Self-regulated' levels. However, the SRL levels of the two case study participants with learning difficulties who did not receive academic support while enrolled in the DP, Samantha and Chloe, were higher than those who did. Moreover, their levels were comparable to those of high-achieving participants.

In fact, Samantha, presenting with multiple learning difficulties and processing diagnosed significantly lower than that of the other LD participants, was one of the most effective self-regulators in this investigation. With this in mind, having a learning difficulty or being a high-achiever did not appear to account for these participants' levels of self-regulation. Instead, the highest self-regulators in both quintains were highly criteria-driven. In other words, they were interested in mastering knowledge and skills in order to achieve the highest criteria possible. Thus, they demonstrated a 'mastery by performance' goal orientation, rather than the 'mastery' approach orientation anticipated. They also consistently demonstrated higher levels of cognitive, metacognitive and, in particular, epistemic awareness.

Furthermore, for participants in both quintains, a developmental aspect to self-regulation was evident. Grade 9, the first year of high school, appeared pivotal to many participants' current approach. It was during Grade 9 that most of the highest self-regulators began experimenting with strategies and identifying those they preferred. However, five of six participants in the high-achieving quintain reported a dip in self-efficacy for self-regulated learning when they entered the DP which, for some, was exacerbated when they experienced their first DP-level examinations or when they began their Extended Essay or IAs. School report teacher comment data suggested that several of the highest self-regulators had successfully navigated a period of adjustment during Grade 11.

Further supporting a developmental aspect to participants' SRL, Grade 12 participants implemented a greater number of strategies than did Grade 11 participants, and all participants self-reported improvements to their strategy use during the Diploma Programme, regardless of quintain and regardless of year. Contradicting Usher and Pajares' (2008) finding that self-efficacy for SRL may decrease as students progress through school, all participants self-reported robust levels of self-efficacy for SRL. Moreover, Grade 12 participants in both quintains reported feeling confident and well-prepared for their upcoming DP exams, attributing this to the repertoire of strategies they had developed over time.

Despite this increased strategy use, school report teacher comment data for participants in both quintains illustrated that, for most participants, developmental SRL levels did not significantly increase, or even significantly fluctuate, over four years (see Appendix S). Karen's level briefly spiked from 'Self-control' to 'Self-regulated,' and Eliza's and Annabelle's briefly dipped from 'Self-Regulated' to 'Self-control' but, overall, the SRL levels of high-achievers remained relatively stable around 'Self-control' and 'Self-regulated' over four years. On the other hand, with the exception of Samantha, the SRL levels of participants with learning difficulties fluctuated more widely. Chloe's teachers' comments, for example, illuminated periods of stress and anxiety that appeared to cause her SRL level to fluctuate between 'Self-control' and 'Self-regulated.' Hannah's level fluctuated more widely but ultimately seemed to have stabilised between the 'Emulation' and 'Self-control' levels. Claire experienced a significant period of adjustment when she first enrolled in the school, at which time her SRL appeared to be at the 'Observation' level, and although her SRL rose to between 'Self-control' and 'Self-regulated' when she started receiving support, it dipped again and never again advanced beyond the 'Emulation' level.

Ultimately, findings support empirical evidence (see Zimmerman *et al*, 1992) that SRL involves more than just strategy use. All participants developed new SRL

strategies that reflected at least a degree of agency, purpose, and instrumentality. Their strategy use helped them rise to increasing levels of challenge inherent in the IB Diploma Programme. Moreover, all developed an increasingly robust sense of self-efficacy for SRL, despite (for most) an early dip when they entered the DP and despite research evidence that suggests they should experience a decline (Usher and Pajares, 2008; Pajares and Valiante, 2002; Caprara *et al*, 2008). However, participants who entered the DP as higher self-regulators remained higher self-regulators, while those who entered the DP as lower self-regulators remained lower self-regulators. Despite developing their repertoire of SRL strategies during their time in the DP, those who brought limitations with them (such as limited self-determination and proactivity, a history of coasting, or perfectionism) continued to grapple with those issues at the time of this investigation.

Furthermore, although participants in both quintains developed their repertoire of strategies over the two-year Diploma Programme, the mechanisms for how high-achieving participants and those with learning difficulties developed new strategies differed. While higher self-regulators in both groups were more likely to invent their own strategies, experiment, refine those that worked well, and discard those that did not, teaching influenced the self-regulation strategies used by participants with learning difficulties in a much more direct and significant way than it did for high-achieving participants. The two low self-regulators with LD submitted and discussed only strategies they had been taught, while the two high self-regulators with LD both invented their own strategies and engaged in a process of co-regulation in which their teachers significantly supported the development of their strategy repertoire. The Development of SRL Across-Case Pattern Display (Appendix O) summarises the findings in relation to the development of SRL of high-achieving participants and those with learning difficulties, distinguished by grade level.

4.1.1 How did the self-regulated learning of lower self-regulators with learning difficulties develop?

Hannah and Claire

As noted above, the two least self-regulated participants in this investigation, Hannah, a Grade 12 participant, and Claire, a Grade 11 participant, were both in the learning difficulties quintain and had continued to receive support while enrolled in the DP. In this section, I will first draw comparisons between these participants before turning to a more detailed analysis of the data related to Claire, the least self-regulated participant in this investigation.

Hannah, who was taking four DP subjects because of the extra time she needed to learn and complete assignments, was rated between the ‘Emulation’ and ‘Self-control’ levels. Claire, who was enrolled in the full Diploma Programme, was rated at the ‘Emulation’ level. The data across measures indicated that both participants used strategies as they perceived them to have been taught, yet with varying degrees of effectiveness. In general, Hannah, took more ownership of particular strategies and was more efficacious in their use, while Claire described a more reactive and helpless approach.

Both participants had arrived at the school in Grade 9 without diagnoses and lacking effective strategies. At that time, low self-efficacy for SRL appeared to contribute to negative social comparisons. *‘When I first started [here] I didn’t know about any of these strategies... I was like the bottom of the barrel of possible grades.’* Both demonstrated disorganisation and poor time management, resulting in frequent sanctions. *‘I remember myself going to detention every week.’* Early strategy attempts reflected limited cognitive awareness (awareness of how to make cognitive progress), metacognitive awareness (awareness of how to monitor cognitive progress), and

epistemic awareness (awareness of the nature of knowledge and how it should be acquired and evaluated) and did not enhance learning. *'I was just copying down every single thing that was in my exercise book... and when I went over my notes, I couldn't understand any of them.'* Neither student explored strategies or reflected upon how they could improve their learning and performance, despite the academic difficulties they experienced. The teacher comments in their student reports from that time indicated poor effort and a chaotic 'approach' to learning across time and task.

Each participant subsequently received a diagnosis of LD and, over a period of roughly two academic years prior to this investigation, engaged in support lessons, through which they developed a range of strategies that they self-reported helped them learn more purposefully and effectively, raising their sense of self-efficacy, thus indicating improving SRL. *'After you taught me about Cornell Notes, and using mind maps or flashcards, I start using these kinds of strategies which helped me a lot because they're less writing and less memorising.'* Both gradually came to recognise that using strategies also helped them manage their time. *'When I started using my time effectively and planning, I stopped getting detentions because I could manage to do all of my homework, projects, revision notes, and everything worked.'*

Hannah and Claire also learned strategies from their DP teachers. For example, Hannah's literature teacher prompted her to highlight and annotate. Hannah's implementation of this strategy reflected a sense of agency, purpose, and instrumentality. *'When I was reading, I was really lost... my teacher told me to always annotate and highlight... when you highlight and annotate, it's really easy for you to understand and go back and study and revise.'* Past paper practice had the same effect. *'Most teachers give us practice papers so we can understand the format... I like that [they are] intentionally trying to show if you're good at this, then you can clearly be good at something that's actually going to be in the exam.'*

Hannah and Claire both believed strategy instruction should be part of teaching from the beginning of the Diploma Programme. *'It's a rigorous programme so if you only learn about [strategies] even two months after you've started, then you've already created bad habits.'* Nonetheless, being taught strategies had potentially inhibited exploration. Both participants reportedly used strategies as taught, without necessarily reflecting on how, how well, or why they worked or what might work better. *'I think I use [my planning calendar] exactly as you taught me.'* Furthermore, strategy implementation often seemed reactive, with a purpose of 'task completion' rather than learning, particularly for Claire. Neither Claire nor Hannah reflected on how well they used strategies or appeared to adapt the strategies they learned to accommodate increasing levels of challenge or complexity. *'When you first explained the planning calendar, the minimum was half an hour, so up until fairly recently I would study half an hour.'*

One significant difference that distinguished the approach of the two least self-regulated participants was their goal orientations. For example, Hannah demonstrated a primarily mastery goal orientation that appeared stimulated by an intrinsic interest in mastery, not grades. *'If it's Venn diagrams, first I need to understand the meanings of the symbols, so I wrote them on flash cards and stuck it on paper... to correct [my mistakes], I usually look at the answer sheet and if I don't understand by myself, I always ask my teacher.'* However, the strength of her motivation was weak and her interest lukewarm, leading to inconsistent effort. *'[If students] have any free time during a day, they should just take a calculator and try to figure out some stuff... [but doing that is] quite boring.'*

The goal orientation profile that emerged from Claire's interview data, on the other hand, was more complex. No single orientation emerged as exerting the greatest influence on her motivation. For example, Claire was frequently convinced she would receive a poor mark for a piece of work, reflecting limited self-efficacy. Because she

preferred not submit work that would receive a poor mark, she often failed to submit assignments, indicating a performance avoidance goal orientation. However, at times sparks of genuine interest shone through, reflecting a mastery approach orientation, leading to more engagement and proactivity. *'I know that, 10 years from now... when I'm reading 'The Economist' for fun, I can actually understand how real things that happen relate to Economics.'* She also occasionally focused on mastering content in order to achieve particular criteria, demonstrating a 'mastery by performance approach' orientation. *'In every ESS exam, there's like two whole pages of definitions... while [flash cards] doesn't have to be the centre of your revision, you should definitely keep it at the back of your mind.'* At other times she seemed to want to avoid not understanding, reflecting a mastery avoidance orientation. *'When I started learning about [the maths parts of Economics], I was like this is not so fun anymore.'*

The 'avoidance' orientation that Claire demonstrated seemed to stem from a tendency to associate her academic and social problems to her ability. *'A teacher will say something that I should be able to do... [but] my brain doesn't really work that way.'* Thus, when overwhelmed, Claire negotiated deadlines, rather than implementing the time management strategies she had been taught. *'If you tell [the teacher] "listen, I'm really struggling" more often than not they'll be understanding.'* When things went wrong, even in social situations, she expressed helplessness and bewilderment rather than reflecting upon what she could have done differently. *'I thought I was being organised but apparently I wasn't, and no one told me... so [my friends] became upset with me... I was like, I don't know what's happening right now, why are people mad?'*

Claire also demonstrated limited proactivity and self-determination, frequently attributing poor performance to teaching rather than reflecting upon her own approach. For example, when describing a poor result on an ESS exam she explained, *'I didn't realise [we needed to learn definitions], because it wasn't explained to us at the very beginning.'* The same was true for English. *'[Our teacher] only showed us what the*

English exam would be like... a week before really.' From her perspective it was also teachers' responsibility to conclude topics with a summary, rather than her own responsibility to review the material. *'I kind of wish there'd be an opportunity for [my teachers] to be like we did this, this and this.'*

Claire also frequently demonstrated poor task calibration and a 'task completion' purpose for learning, paying little attention to the quality of her performance. For example, although she had highlighted almost nothing in the biome case study model her teacher had been provided (see p. 115), she was convinced she had been effective. *'I highlighted the most important information.'* Despite being taught to use the criteria for self-monitoring and evaluation, the data illustrated that she rarely self-evaluated her performance, unless clear external standards, such as a mark scheme, were readily available.

The SRL holistic ratings generated by teachers' comments in Claire's most recent school reports closely aligned with the picture that emerged from other data. Two DP teachers commented that she worked hard and was eager to learn. *'[Claire] has worked very well this semester, engaging with both our study of language and literature with equal enthusiasm and contributing valuably to class discussions.'* However, four teachers commented on limited effort. *'While [Claire] clearly enjoys the course, she needs to make a much more concerted effort to manage her time effectively as she has consistently been late with internal written deadlines... she will be at a great disadvantage if she does not keep up to speed.'* There was a lot of support available to her, but Claire did not seem to take advantage of this, further reflecting limited SRL.

4.1.2 How did the self-regulated learning of the highest self-regulator with learning difficulties develop?

Samantha

Samantha was a Grade 12 participant with multiple learning difficulties, each of which entitled her to 50% extra time on her IB examinations. She had been involved in a support programme in primary and middle school, had a reduced timetable in the Middle Years Programme, and was only taking three DP subjects because of the extra time she needed to learn and complete assignments. Despite this, she had not required support lessons while enrolled in the DP. Rated at the highest levels on every measure of SRL, Samantha was one of the highest self-regulators in this investigation.

Every data set in Samantha's case indicated that she knew who could help her and proactively sought their help, reflected upon how she learned best, and exerted the effort required to succeed to her potential. *'Audio, audio, audio... I probably listened to the book 20 times before doing my exam.'* Furthermore, the SRL strategies she implemented in the DP demonstrated full awareness of her strengths and weaknesses and capitalised upon her propensity for hard work. *'I put time and effort into making notes the first time so they're clear and neat, so when I'm really busy and stressed I don't have to do them again.'*

Samantha was motivated primarily by a 'mastery by performance' goal orientation. In other words, she aimed for the highest criteria possible by attempting to master skills and content. At the same time, she found it hard to judge her own performance against the standards (task calibration). Thus, she took a highly proactive, 'co-regulatory' approach. *'In my exam I rewrote the first page, emailed it to [my teacher] and said, 'Have I taken on board all your feedback?' I'll just keep reworking it until it's a 7... that's the only way you really improve, by taking on board the teacher's comments, checking you've understood, and practising over and over again.'*

Proactivity, reflection and enormous levels of effort characterised her approach in every subject. *'Reading the comments, reading the paper... I write a list of what I didn't do well on and then I'll revise the topics over and over, and probably do another past paper... you need to work on the basis that you can always do better.'* 'Shared regulation' with peers was also vital to her approach. *'When we're doing exam preparation, we could go, tell me about the author's history... and if anybody else had any points I could add it into my table.'*

Samantha also took full advantage of student-centred, process focused aspects of teaching. Her theatre teacher, for example, scaffolded Samantha's IA process, contributing to Samantha's sense of self-efficacy. *'[This planning calendar] is really useful... I knew that [my script was] due on 29th September so... I had a selection during the summer, which I narrowed down, and I talked to my teacher about which one I should pick. I had loads of time before the deadline.'* Her geography teacher did the same, offering formative assessment as well. *'[My teacher] told me that for my first essay I should colour code it... it wasn't a very good essay, but her feedback was really helpful, and it was a really good learning thing about how to write a proper geography essay.'* Samantha's highly reflective, proactive approach enhanced her sense of agency and confidence as her IB examinations approached. *'I'm well-prepared because I've taken the time to make revision notes. If I haven't understood, I've gone back to my teacher. It's all about taking the time to do things properly.'* Because of this combination of her own proactivity and her teachers' student-centred practices, Samantha did not require specialist learning support in the Diploma Programme.

The SRL holistic ratings generated by teachers' comments in Samantha's most recent school report closely aligned with the ratings generated by other data. *'[Samantha] has been the ultimate role model, hard-working, conscientious, and always willing to go the extra mile... she has demonstrated that hard work can lead to success in*

every lesson. She has never shied away from analysing her own mistakes and, over the course of the last two years, she has consolidated her understanding.'

4.1.3 How did the self-regulated learning of relatively lower self-regulators in the high-achieving quintain develop?

Karen

Karen was a high-achieving Grade 12 participant who was rated between the 'Self-control' and 'Self-regulated' levels. Karen had previously attended a school for 'highly gifted' students where she had been advanced a year. She had enrolled at her present school in Grade 7, bringing with her strategies associated with ease of learning, in other words 'metacognitive illusions.' *'I used to revise by looking at a textbook, reading it, re-reading it and then closing the textbook.* She had started experimenting with strategies in Grade 9. *'I started experimenting with different things... once I figured out what worked... I stuck with that and refined it.'* Believing she would ultimately perform well on her DP coursework and final examinations through occasional effort exertion, Karen demonstrated a primarily performance approach orientation. She thus spent most of the two-year DP coasting and underachieving relative to her potential.

Karen was, in general, dissatisfied with her school experience. *'I think it's kind of a shame that all we do is listen and take down what the teacher's saying.... it makes the interpretation of the book that everyone has basically identical to the teacher's.'* She would have preferred more opportunities to engage in discussions. *'I think it would be good to find any time at all to have discussions about the book, and to hear everyone else's opinions.'* Karen did not view her teachers as integral to her learning and was frequently absent from school. *'I'm not that reliant on teachers.'* However, after achieving poor mock examination results in Grade 12, she had regretted her approach. *'I*

wish I'd been [revising] throughout Grade 11.' Nonetheless, she had continued to take short-cuts, such as assessment sharing, to make learning easier. *'We typed up our exams and feedback and exchanged those... so we got solid essays for all the different [questions], which was quite helpful.'*

However, Karen suggested that there was little that her teachers could have done to influence her approach. *'Teachers try, but in the end it's up to the students themselves whether they're going to do it.'* Nevertheless, when she had opportunities to engage with her teachers in relation to highly challenging academic work she was genuinely interested in, such as DP internally assessed coursework in history and mathematics, a highly ambitious 'mastery by performance' approach orientation emerged. *'After I spoke with [my history teacher] I re-evaluated my sources and completely switched my argument around... you have to be focused enough and ambitious enough... it's a choice about what you want to achieve.'*

With DP exams looming, Karen had recently overhauled her approach and was now exerting more effort and had begun to implement strategies to manage her time. *'It's really important to [study] as soon as you get home, because once you've already started watching Netflix, you're not likely to go back and do it.'* She was confident in her new approach. *'Every day I just go home and start on this study plan, and it works out perfectly... by May I'll have done the entire syllabus twice over.'*

The SRL holistic ratings generated by teachers' comments in Karen's most recent school report aligned with the ratings generated by other data. Five of her teachers suggested that she worked enthusiastically and effectively, particularly when interested. *'[Karen] analysed the game of Monopoly for her Exploration and demonstrated many interesting ideas linked to the strategy of the game. She worked independently, teaching herself Matrices, and was one of the first to complete the assignment.'* However, one suggested she could work harder. *'I hope that she revises her work in depth in preparation for the upcoming DP examination to finally do herself justice.'*

Piper

Piper was a high-achieving Grade 11 participant rated between the ‘Self-control’ and ‘Self-regulated’ levels. Piper had arrived at the school in Grade 8 with few strategies, but the wider school culture had positively influenced her approach, particularly to time management. *‘All the presentations, and the school’s attitude, I guess, towards the planning calendar... it really does work.* In the DP, being able to manage her time effectively had reduced Piper’s stress. *‘When you get a really big workload, you can cope... I’m not stressed or flustered... it’s not overwhelming.’* She had also identified how she learned best through trial and error. *‘Through trial and error, I’ve realised that condensing information is what works for me.’*

Nevertheless, a history of effortless high performance had hindered the development of Piper’s self-regulation. As suggested by Reis and Renzulli (2010), she had ‘systematically [learned] not to work’ (p. 313) before enrolling in the DP. She was still finding it difficult to adapt. *‘I’m still thinking, ‘Why do I have to do the extra work?’ I’ve never had to do it before.’* Interested in achieving good grades as opposed to mastering criteria, Piper appeared motivated by a primarily performance approach orientation. However, she had not achieved as well as expected on her first set DP examinations and had recently begun to exert more effort. *‘I definitely realise now how the DP works. I want to do the extra revision, so I can get good marks.’* However, she continued to coast when she thought she could achieve good grades without extra effort. *‘There are some classes that I don’t need to do much extra revision for.’*

The SRL holistic ratings generated by teachers’ comments in Piper’s most recent school report aligned with ratings generated by other data. Five of her DP teachers’ comments indicated a self-regulated approach. *‘[Piper] continues to work with energy and insight, consistently leading discussions and refining her critical acuity... she has shown tremendous personal enthusiasm for our study of language... and has made a flying start to her Extended Essay, starting precociously early.’* However, one teacher

suggested otherwise. *'[Piper] is still distracted during class which is impacting results. If she finds a topic difficult, she knows I am happy to arrange additional sessions, but she needs to be proactive and take greater ownership over her learning.'*

Sarah

Sarah, another high-achieving Grade 11 student, was also rated between the 'Self-control' and 'Self-regulated' levels. However, unlike Karen and Piper, this was primarily due to cycles of perfectionism and procrastination that negatively impacted otherwise high levels of self-regulation. During 'Self-regulated' cycles, Sarah was incredibly motivated, exerted enormous levels of effort, implemented a wide range of strategies, closely monitored her own learning, and was highly self-reflective. *'I make a spreadsheet of the units I've covered and put a 'check' if I've completed my notes... I put a number [1-10] depending on how confident I am. Closer to exams, I pick the ones that have a low number and work on them... [there's a] reflection space to write what I can improve on.'* She also demonstrated advanced epistemic awareness, including sophisticated understandings of how knowledge can be acquired and evaluated. *'Assignments are definitely not an accurate judgement of how you're performing... [instead,] focus on how you are actually studying the topic and understanding it.'*

When Sarah's teachers recommended particular strategies, she tried them and monitored their impact on her learning, but she preferred to invent her own. *'A lot of teachers recommend things like Cornell Notes and 4-Column Charts, and they're very helpful, but I prefer sticking to my own format.'* She also used strategies to manage her time. *'If I've got a massive amount of work... I finish the urgent and important first, move onto the urgent but not important, the important but not urgent and then, finally, the less important ones.'*

Sarah frequently talked about her parents during her interview, particularly their expectations. *'[My parents] often comment that... it's completely fine to get a 6 if a 6 is your maximum potential, but if your maximum potential is a 7, you're clearly doing something wrong.'* Although she was confident in her ability, external expectations caused anxiety. *'Other people [expect] me to get a 45 [a perfect score in the DP]... that leads me to believe I can achieve it, but I'm also worried I'm going to let people down or myself down.'* Identifying herself as a perfectionist, she put more effort than needed into creating beautifully hand-written notes. *'I realised, well, perfectionism... I was putting too much time and effort into this... by the time I'd gotten to three sentences I'd already understood the concept.'*

Sarah worked very long hours, which impacted her sleep. *'A late night can mean 1am or 3am... but if I go to sleep at 12am and wake up at 4am and study, that works [better].'* Her relentless routine occasionally diminished her motivation and resulted in cycles of procrastination. *'It's nice to start out with complete enthusiasm, but [sometimes] I've worked so much... I'll face sort of a 'workload paralysis' where I'll procrastinate and won't be able to get quality work done for a longer period of time.'*

Although not highlighting Sarah's self-reported perfectionism, the SRL holistic ratings generated by all of her teachers' comments in her most recent school report closely aligned with the ratings generated by other data. *'[Sarah] remains an incredible economics student. She studies for very deep understanding and asks very high-level questions... she continues to demonstrate very strong analytic ability and an amazing work ethic.'*

4.1.4 How did the self-regulated learning of the most effective self-regulators in the high-achieving quintain develop?

Ally

Ally, a high-achieving Grade 12 participant rated at the 'self-regulated' level, demonstrated an exploratory orientation based on an awareness of how she learned best and a strong desire to learn and succeed. *'I always knew I'm the kind of person who can talk a lot... when I was younger, I'd walk around my house as if I were explaining [something] to someone or I'd go up to my mum and say, "Did you know this?" and start telling her loads of facts.'* In the DP, she had adapted her previous approach by recording her responses to essay questions and printing transcripts. *'I spoke into my phone and I answered [the question] as if it was an essay... now when I'm revising, I can look at the transcript.'* Although Ally rarely mentioned guidance from teachers, she found it useful on occasion. *'[My teacher told me] to try to have notes which are quite simple, because the night before the exam you're not going to have enough time to look at everything.'*

Although Ally's effort and achievement had been consistently high throughout the DP, Ally's school report teacher comments from Grade 11 reflect a difficult transition from the MYP to the DP. *'[Ally] did find there was something of a jump from the expectations academically between Grade 10 and the beginning of the IB Diploma course. Yet, she is thorough, conscientious and willing to taking risks in trying new learning strategies to enable progress.'* The Extended Essay, in particular, had challenged her self-management skills. *'I started doing [the Extended Essay] slightly later than I wanted to because I was too busy focusing on small homework tasks.'* Nonetheless, she did not feel that teachers should interfere with how students approached their learning. *'If a student is... like "oh my God, I'm so stressed," I guess they should help, but I just think everyone should... find a way that works best for*

them.' Her advice to teachers was well-aligned with Winne's (2018) information processing perspective. *'Encourage students to explore whatever works for them.'*

Ally was highly self-effacious and her overall approach, driven by mastering criteria, reflected a 'mastery by performance' approach orientation. She used efficient, 'deep' strategies aimed at acquiring rigorous content knowledge, conceptual understanding, and long-term retention. *'I'll analyse a prose text or poem, so I know what I would do if I had to write an essay... in two hours, I could probably analyse four of them rather than write one essay.'* She attributed her approach to a growth mindset. *'I've really developed a growth mindset... I started off with a fixed one whereas, oh my god, I got a bad grade in this test, I'm a failure. But... it's more about looking at... how I approached it and what I could have done better... reflecting on what I've learnt and moving forward.'* There was also an element of competitive striving in her approach, as consistently indicated by her school report teacher comments over four years. *'[Ally] brings a fantastic competitive nature to our class. She is constantly pushing herself to get better and thrives in a collaborative setting. [Ally] is very enthusiastic and her demeanour is infectious.'* While ambitious, aiming for a perfect score of 45 points in the DP and aspiring to study law at Oxford, Ally focused on how, not whether, she could meet her goals. *'I realised I should stop focusing on the grades I'm getting right now and focus on how I'm going to achieve the grades I want.'*

The SRL holistic ratings generated by all of the teachers' comments in Ally's most recent school report aligned with the ratings generated by all other data. *'[Ally] remains thoroughly focused on her work and is approaching the final weeks of the course with an impressive sense of calm and determination. Her attainment... has been nothing short of outstanding.'*

Eliza

Eliza was another high-achieving Grade 12 participant, rated at the ‘Self-regulated’ level, who demonstrated an exploratory orientation based on a strong desire to learn and succeed. However, unlike Ally, Eliza was not a native English speaker. She had arrived at the school in Grade 9 with limited English proficiency and had struggled to learn the English language curriculum. Through trial and error, she had found a learning strategy that helped. *‘I tried making class notes in Grade 9... it didn’t really work because I prefer to focus on listening and understanding, rather than writing it down, [so] I decided that it would be much easier for me to learn if I do the note-taking at home.’* Over time she had adapted this strategy. *‘I started using diagrams [and] colours because it’s easier for me to just read a few sentences instead of long paragraphs like in textbooks.’* By the end of Grade 10, she had settled on her approach, which she continued to refine over time. *‘I tried out a lot of things, so I knew what works well for me by the end of Grade 10. [My approach] hasn’t changed much but it has become easier because I spent so much time doing it.’*

Eliza also invented her own motivation strategies. *‘If there’s one subject that needs a lot of work, I put something in between so my brain wouldn’t think I’m doing physics all the time, or chemistry, but instead doing a few things.’* She experimented with strategies she learned from others, as well. *‘I found this [You-tuber] who studies Computer Science at [a very good] university... he shared his entire experience, how he worked... it makes you want to be like him, [so] I just decided to follow it.’* However, she adapted any strategies she discovered to her own preferences. *‘When it’s closer to exams, [instead of doing it like he does] I would have a better schedule of what I want to revise every day.’*

Like Ally, Eliza was ambitious, but when she was younger and her ambition was not matched by her performance, she became discouraged. As her metacognitive awareness improved, she was better able to both monitor her progress and meet the goals

she set for herself. *'It's easy to be very ambitious and plan a lot of things in one day... when I first started, I would set up so many things that I couldn't get through it. Then I used to feel really bad about myself. But you start to learn what you can achieve... it's very satisfying to do that.'* An element of metacognition that Eliza consistently implemented in order to meet her goals was creating 'desirable difficulties.' In other words, she understood that effective learning was not easy. *'It's important to go over what you learn every time you have a class because it can be challenging... if you're lost once, you're not going to be able to understand [other topics] that follow.'*

Demonstrating a primarily 'mastery by performance' approach orientation, Eliza's self-evaluations of her own performance against the criteria also indicated high levels of epistemic awareness. *'I compare my answers to the mark scheme.... [then] I go back to the textbook to see if I'm losing [points]... it's not enough to just look at the mark scheme.'* To support her sophisticated self-evaluations, she also sought formative assessment from her teachers and peers. *'I give some essays to my teacher to mark... [or] I exchange them with another student to mark for each other.'*

The SRL holistic ratings generated by teachers' comments in Eliza's most recent school report aligned with the ratings generated by other data. *'[Eliza] has completed her TOK course in a very composed and self-assured manner. She worked with commendable diligence and perseverance on her essay. Spending hours refining every aspect of her argumentation means she can be truly proud of the final product.'*

Research Question 2: In this context, do the strategies that high-achieving IBDP students use to regulate their learning differ from those students with learning difficulties use? If so, how do they differ and what accounts for these differences?

Summary

Having analysed the findings in relation to how high-achieving IB Diploma Programme participants and those with learning difficulties developed self-regulation, I now turn to the findings in relation to Question 2. I begin by briefly comparing the *number* and *type* of strategies implemented by participants in the two quintains. I then draw out the analysis in relation to the *quality* of work samples submitted using ‘illustrative’ examples: a low and a high-self regulator with learning difficulties and a high self-regulator in the high-achieving quintain.

Overall, there were no notable differences in the number or type of strategies participants in the learning difficulties and high-achieving quintains implemented. Furthermore, while the overall quality of the work samples submitted by two of the participants with learning difficulties was lower than that of the work samples submitted by high-achievers, the quality of their work samples varied rather than being consistently low. Moreover, the quality of the work samples submitted by the other two participants with learning difficulties was comparable to that of the high-achievers. Thus, having a learning difficulty or being a high-achiever did not appear to determine strategy quality.

4.2.1 Did the number of strategies implemented by participants in the two quintains differ?

The strategies listed in the left-hand column of Table 7 (below) were generated by the data and expand upon those described by Zimmerman and Martinez-Pons (1986). The rows in Table 7 whether or not all of the participants in each category (Grade 11 HA, Grade 12 HA, Grade 11 LD, Grade 12 LD) used the strategies listed in the left-hand column. A ‘Y’ indicates that all students in a particular category used the strategy, while an ‘N’ indicates that all students in a particular category did not use the strategy. In the

bottom row, the number of Y's in each column are added together to make comparisons of strategy use between quintains and grade levels more straightforward. As Table 7 illustrates, of the 21 strategies students submitted or self-reported, there were nine that all high-achieving Grade 11 participants submitted or self-reported, fourteen that all high-achieving Grade 12 participants submitted or self-reported, ten that all Grade 11 participants with LD submitted or self-reported, and fourteen that all of Grade 12 participants with LD submitted or self-reported.

Table 7 illustrates that, although a common claim is that students with learning difficulties use fewer strategies than their non-LD peers (Ruban *et al*, 2003; Watson *et al*, 2016; Zimmerman, 1990, Butler *et al*, 2011), this was not the case in the current investigation. In fact, the number of strategies participants with LD submitted or self-reported was virtually indistinguishable from the number of strategies high-achieving participants submitted or self-reported. Conversely, time spent in the Diploma Programme did make a difference. In both quintains, participants in the second year of the DP used more strategies than did participants in the first year.

4.2.2 Did the type of strategies participants in the two groups implemented differ?

As shown in Table 7 (below), the types of strategies that participants with learning difficulties submitted or self-reported were similar to those high-achieving participants submitted or self-reported. Although differences were very slight, relatively more high-achieving participants self-reported using flashcards, studying with others,

[Table 7: Number of participants who reported using particular strategies aggregated by year group and quintain]

	Grade 11 HA (n=3)	Grade 12 HA (n=3)	Grade 11 LD (n=2)	Grade 12 LD (n=2)
1. Rereading of notes or textbook	Y	Y	Y	Y
2. Practice problems/past papers	Y	Y	Y	Y
3. Flashcards	N	N	N	N
4. Rewrite notes in new format	Y	Y	Y	Y
5. Consolidate notes	Y	Y	Y	Y
6. Study with others	N	N	N	N
7. Memorise'	N	N	N	N
8. Self-test	N	Y	Y	Y
9. Highlight and annotate	N	Y	N	Y
10. Writing process	N	Y	N	Y
11. Planning/time management	Y	Y	Y	Y
12. Use colours, diagrams, or tables to help visualise	Y	Y	N	Y
13. Self-evaluation or reflection	Y	Y	Y	Y
14. Test corrections	N	N	N	N
15. Essay plans for revision	N	Y	N	Y
16. Help-seeking	N	N	Y	Y
17. Regular previewing and/or regular revision	Y	Y	Y	Y
18. Wider reading or independent reading	N	Y	N	Y
19. Motivation control	N	Y	N	N
20. Affective control	Y	N	Y	N
21. Avoiding distractions	N	N	N	N
Frequency of strategies self-reported by all participants in each grade level	9	14	10	14

highlighting and annotating, engaging in writing as a process, engaging in wider reading, avoiding distractions and using strategies to control motivation or emotions. Only a slightly larger number of participants with learning difficulties self-reported asking for help and testing themselves. However, participants who used flashcards or completed practice problems or past papers may have been engaging in self-testing although they did not explicitly state this. Thus, some differences in strategy use may mask actual similarities, as suggested by Karpicke *et al* (2009).

Some of the differences between the two groups were using colours, diagrams or tables to visualise material and creating essay plans to revise for essay exams. Only Grade 11 participants with learning difficulties did not report implementing these strategies. It was also interesting that most participants did not report correcting errors on tests, suggesting that they did not utilise tests as a method of formative assessment in order to improve learning and performance. Only one participant, a Grade 11 participant with LD, reported correcting her errors on tests. However, it is likely that participants in both groups used strategies that they did not either submit or self-report. Therefore, Table 7 reflects a helpful ‘snapshot’ of participants’ actual approaches to learning but should not be considered the whole picture.

4.2.3 Did the quality of strategies implemented by participants in the two quintains differ?

Summary

Given the limited space available for this analysis I draw upon three illustrative examples. To make distinctions between lower and higher quality strategy implementation, I evaluate participants’ cognitive, metacognitive, and epistemic processing as reflected by the work samples they submitted. Evaluations were informed by the ‘Work Samples Evaluation Sheet’ (Appendix G), described in Chapter 3, and accompanying interview and reflection data. Within each category, a rating of ‘limited’ implementation of target criteria corresponded to the ‘Observation’ level of SRL development; a rating ‘adequate’ corresponded to the ‘Emulation’ level of SRL development; a rating of ‘substantial’ corresponded to the ‘Self-control’ level of SRL development; and a rating of ‘excellent’ corresponded to the ‘Self-regulation’ level of

SRL development. Refer to Table 3 (p. 75) for an overview of the holistic ratings calculated for each participants' work samples.

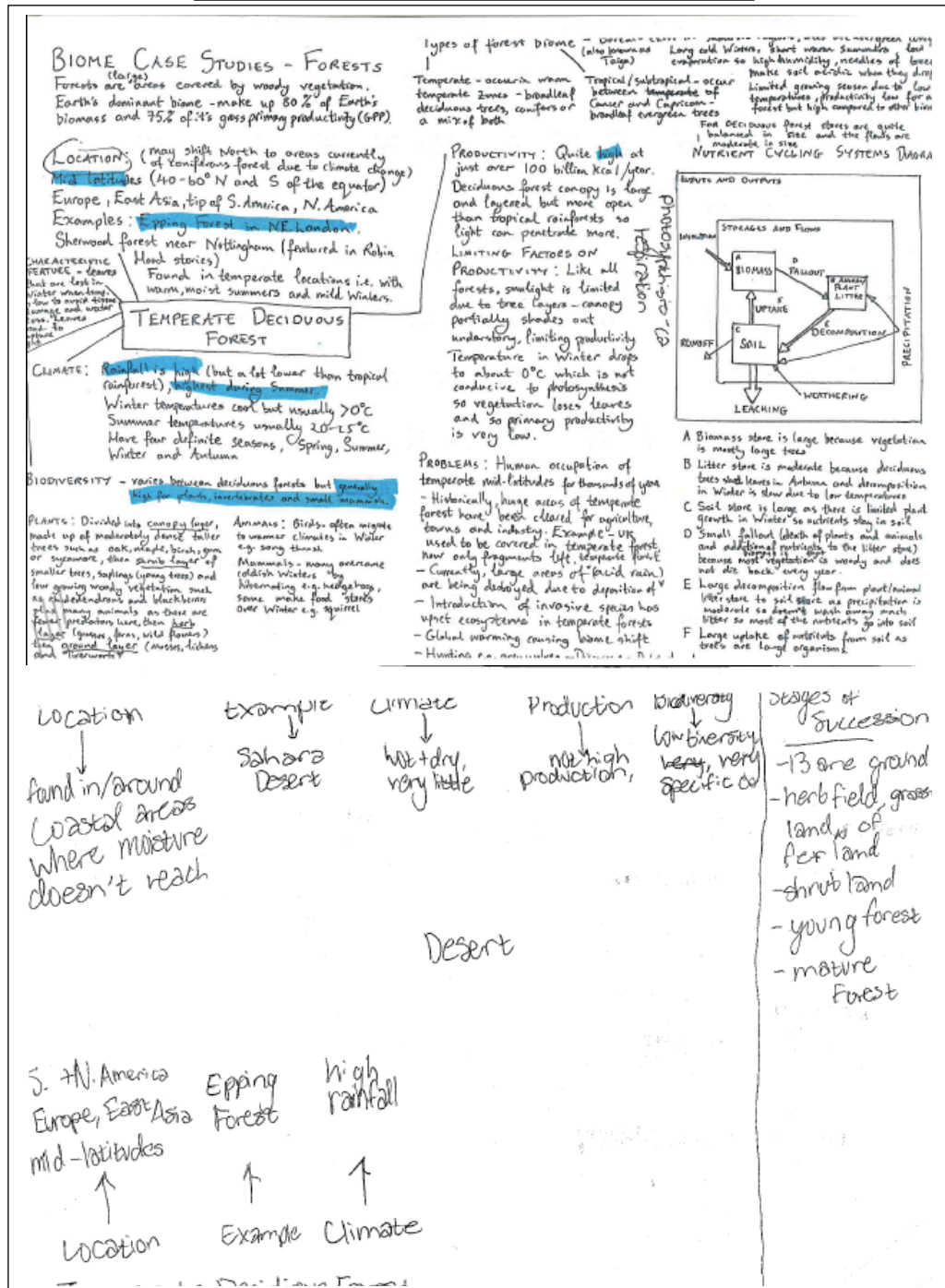
The high quality of Samantha's work samples and varying quality of Claire's suggests that strategy quality was not 'caused' by their learning difficulties. Supporting findings by Trainin and Swanson (2005), both students appeared to have compensated for their diagnosed processing difficulties through strategy use, albeit with varying degrees of success. For example, Samantha, whose learning difficulties were far more significant than any of the other participants, found task calibration a challenge. She compensated by proactively seeking formative assessment and utilising the scaffolding offered by teachers. Claire, relying primarily on strategies she had been taught in her support lessons, demonstrated relative strengths in cognitive and metacognitive awareness and a relative weakness in epistemic awareness, which had not been taught. I now turn to a discussion of the quality of four work samples submitted by each of three participants (Claire, a low self-regulator with learning difficulties; Samantha, a high self-regulator with learning difficulties; and Ally, a high self-regulator in the high-achieving quintain).

4.2.3.i Evaluation of work samples submitted by a low self-regulator with learning difficulties (Claire)

'Adequate/Emulation' quality work sample

The first work sample Claire submitted was a four-column chart she created for Environmental Systems and Societies (ESS). Her teacher had provided a model biome case study (top of Image 1) to help students understand the expectations, and Claire

Image 1: Biome case study four-column chart



decided she would create hers on the back of the model for easier comparison between biomes (bottom of Image 1). I evaluated Claire's work sample at the Adequate/Emulation level for cognitive awareness. She had adapted the strategy to the

task by creating appropriate headings, she reduced the number of words to $\frac{1}{4}$ or less of the original text, and her notes reflected some of Winne's (2018) SMART processes. For example, she transformed the information into a new representation that facilitated rehearsal, recall, understanding, and analysis, and she had searched for information about her biome. However, Claire had not accurately monitored the degree to which her own case study corresponded to the standard provided and had overestimated her performance. *'On the back I wrote down that [biome] information for a desert so I could easily compare the two.'* Furthermore, Claire had not demonstrated higher order thinking according to Bloom's taxonomy, which she could have done by incorporating diagrams, sketches, or further examples to facilitate deeper conceptual understanding, and her case study did not reflect rigorous content knowledge or sound understanding.

In terms of metacognitive awareness, I evaluated Claire's four-column chart at the Adequate/Emulation level. I rated it at the Substantia//Self-Control level for creating 'desirable difficulties' because it reflected the spacing effect, the generation effect and the testing effect. The notes were her own, written in a format that could facilitate self-testing, and formed part of her programme of regular revision. In the 'avoiding illusions of competence' category, she had focused on relevant information rather than interesting but irrelevant details and purposely selected a strategy she believed would work. *'It's just really based on what I feel would work best in the situation.'* Claire's four-column chart, however, reflected little effort. *['My teacher] did say... [we] don't necessarily need this much information for the exam but [she] thought [we] should have it anyway.'* There was also too little information in these notes to help Claire effectively monitor what she knew or did not know.

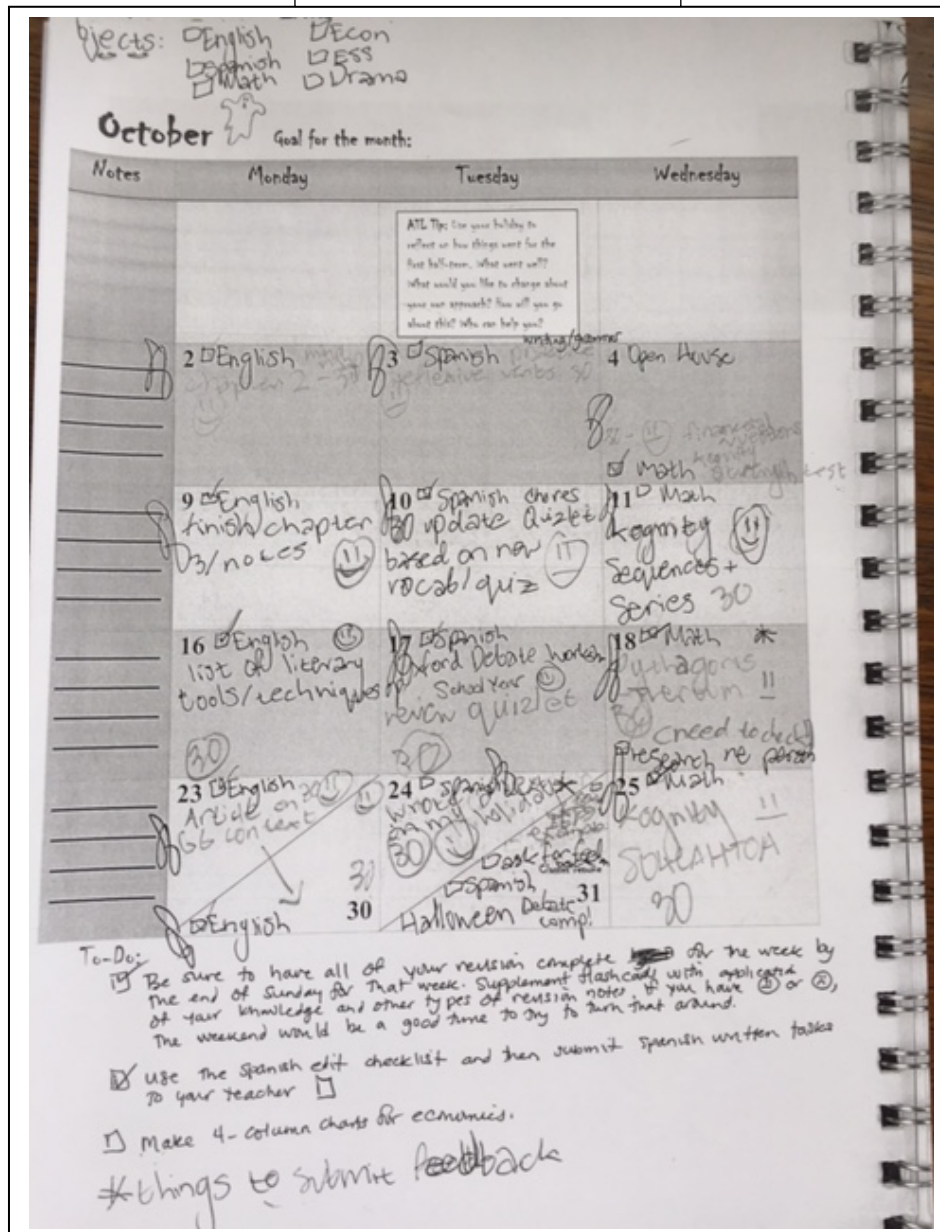
I evaluated Claire's four-column chart at the Limited/Observation level for epistemic awareness. On the one hand, she had explored a new strategy. *'I did maybe two [four-column charts] last year, [but] I've used them a lot more. I find them a really easy way of organising something in a really specific way.'* She had also transformed the

material into a format with potential to promote rigorous content knowledge, conceptual understanding, and long-term retention (deep learning) by offering opportunities to analyse and compare various aspects of a biome as well as practice retrieval. However, her implementation was shallow. Although her teacher's example (top half of Image 1) demonstrates rigorous content knowledge and conceptual understanding, Claire's 4-column chart included only simple, rote facts with no effort at linking them together. The information she included was also so sparse that it demonstrated little awareness of the uncertainty or variability of complex knowledge. Furthermore, although she had selected this strategy because she assumed it would work, she did not provide any basis for this judgement, nor did she describe how she might monitor her understanding or provide standards for 'knowing.'

'Substantial/Self-control' quality strategy

The second work sample that Claire submitted was a page from her planning calendar. This strategy did not demonstrate cognitive or epistemic awareness, but I rated it at the Substantial/Self-Control level for metacognitive awareness. In the 'creating desirable difficulties' criteria, Claire's planning calendar demonstrated evidence of spacing study sessions, the generation effect, the testing effect and, over time, interleaving topics, although she 'blocked' topics during individual study sessions. In the 'avoiding illusions of competence' criteria, Claire engaged in dual code presentations, revised static (not animated) material, and focused on relevant, rather than high interest but irrelevant information. In the 'metacognitive monitoring' criteria, Claire had monitored how well she perceived she had learned material by drawing a 'smiley' face when she had learned the material well, a 'flat' face when she felt her learning was tenuous, and a 'frownie' face when she felt she had not learned.

Image 2: Planning calendar



However, in the ‘demonstrates awareness of strengths and weaknesses’ criteria (Winne, 2018), Claire’s planning calendar was rated at the Adequate/Emulation level. My signature throughout indicated Claire had received feedback on her strategy use, but there was no indication that she acted on that feedback. For example, the school report teacher comments for the reporting period associated with the submitted calendar page indicated that she had missed several deadlines, yet Claire’s planning calendar did not

demonstrate efforts to manage long-term tasks. *‘[Claire] has failed to hand in work on time... it is crucial that she develops strategies for time management that really work.’*

‘Excellent/self-regulated’ quality strategy

The next work sample that Claire submitted was a Spanish past paper. I evaluated this strategy at the Excellent/Self-Regulated level in the cognitive awareness criteria because it involved SMART cognitive processes and was an appropriate strategy for exam preparation. It also reflected evidence of task complexity according to Bloom’s taxonomy and, having achieved 12/14 marks according to the mark scheme, it demonstrated sound understanding in relation to subject specific criteria.

An evaluation of Excellent/Self-Regulated in the metacognitive awareness criteria reflected Claire’s creation of ‘desirable difficulties,’ in particular the ‘spacing effect’ because this strategy formed part of her programme of regular revision, and the ‘testing effect’ because she attempted the paper without looking back at her notes. She had also avoided developing illusions of competence by interleaving reading, writing and vocabulary and, given that this was a published past paper, she had focused her attention on relevant information. This strategy also demonstrated high levels of metacognitive monitoring. *‘I used it to see what level I needed to be on.’* Finally, she had made note of vocabulary she had struggled with and described how she had resolved these issues, suggesting an awareness of her strengths and weaknesses.

I evaluated Claire’s implementation of the Spanish past paper as Excellent/Self-Regulated for epistemic awareness. In the surface/deep criteria, the strategy was evaluated as Excellent/Self-Regulated for depth because it required conceptual

Image 3: Spanish past paper

Texto D

"Estar lejos de tu familia te ayuda a conocerte"

Arthur, Noemi y Basile son tres alumnos de bachillerato de Lieja, ciudad belga cerca de la frontera con Holanda. Este trimestre acuden a clases en el Instituto de Enseñanza Secundaria "La Azucarera" de Zaragoza.

Laura Rabanaque (El Periódico del Estudiante)

[Pregunta X]
Tres meses. Vinimos en septiembre y estaremos hasta el 18 de diciembre.

[Pregunta 1]
Un año antes de venir aquí, pero no aprendimos mucho. Hemos aprendido más en el mes y medio que hemos estado aquí.

[Pregunta 2]
España es la única opción. Hay una selección de los candidatos y puedes inscribirte si quieres. Nosotros hemos venido para aprender la lengua, conocer a otras personas y vivir una experiencia nueva.

[Pregunta 3]
Fue una sorpresa descubrir que los españoles salen todos los fines de semana. Tampoco sabíamos que comen más tarde y mucha cantidad de comida, ni que la mayoría vive en pisos. Para nosotros en Bélgica es diferente porque no vivimos en la ciudad, vivimos en el campo y dependemos más del coche y de los horarios.

[Pregunta 4]
Bastante. Nosotros aquí tenemos que estudiar mucho. En Bélgica estudias en el instituto; allí estudias en la universidad, solo se necesita el título y a veces se hace un examen dependiendo de la universidad o de la carrera. Aquí para estudiar Medicina por ejemplo, se necesita un 12 sobre 14 y eso es mucho.

[Pregunta 5]
Sobre todo los horarios y vivir con otra familia. Aquí las familias tienen más normas porque vivimos en la ciudad y en Bélgica vivimos en el campo y tenemos más libertad. Es también complicado adaptarse a la vida en un piso pequeño.

¿Recomendaríais a otra gente de vuestra edad probar esta experiencia de estudiar un tiempo fuera de casa? ¿Por qué?

Sí, sobre todo [- X -] a Bélgica. Tienen que saber que hay diferentes [- 32 -] muy cerca de aquí. En Bélgica tenemos menos presión y la vida es más [- 33 -]. Aquí hay más actividades pero hay más presión. Es una experiencia que [- 34 -]. Hay momentos que son difíciles pero los tres [- 35 -] pasan rápido. Sobre todo, estar lejos de tu familia te ayuda a conocerte.

<http://www.periodicodelestudiante.net/noticia.asp?pkid=3893>

33) tranquilo 35) meses
34) a dejamos

understanding as well as recall. It also suggested awareness of the variability of knowledge in that Claire recognised the need for a complex strategy for a complex learning goal. In the 'evidence of multiple standards for knowing' criteria, this strategy was evaluated as Excellent/Self-Regulated because Claire had checked her work against the mark scheme and corrected her errors. In the 'indication of awareness of uncertainty, ambiguity or incoherence of complex knowledge' criteria, this strategy was evaluated as

Excellent/Self-Regulated because she had realised this strategy might not ensure competence on its own. *'If there were particular words I didn't recognise I took note of it and wrote down the translation, [in case] maybe I should add it to flash cards or something.'*

'Substantial' quality strategy

The last work sample Claire submitted was a four-column chart she had created to synthesise her learning at the end of the 'Broken English' unit in her Language and Literature class. I evaluated this strategy at the Substantial/Self-Control level for cognitive awareness. For example, it involved SMART cognitive processes, was appropriate for and adapted to the task, and demonstrated elaboration. *'I reviewed the literature we'd read and the notes I'd made...'* Claire's implementation of this strategy also suggested analysis and evaluation, rather than just recall and understanding. *'Instead of doing it knowledge-wise, [this] was more of an opportunity to re-evaluate*

Image 4: 'Broken language' four-column chart

subject	similarities	misconceptions	Importance in Language
Broken English	<ul style="list-style-type: none"> - Sometimes ppl live in a English country speaking for a longer time and they still have trouble with the language 	<ul style="list-style-type: none"> - your level of intelligence can be measured by level of English - how hard it is to learn and progress with language when you are working at the same time 	<ul style="list-style-type: none"> - we can use it as a way to understand those that have trouble communicating - can help us analyse texts that are not in perfect English

and analyse what we'd already done.' However, the amount of information she included was quite limited as a synthesis of an entire unit's learning, indicating she had not monitored the degree to which the information she included corresponded to the standards, and her implementation of this strategy did not demonstrate application or creation in relation to Bloom's taxonomy or sound understanding in relation to the criteria.

In the metacognitive awareness criteria, I evaluated this strategy at the Substantial/Self-Control level for metacognitive monitoring, particularly pace of learning, task completion, and reliability of strategy. *'I could have done a mind map... but I wanted to do something that was quite organised and straightforward.'* I also evaluated it highly for creating desirable difficulties, because she had reviewed the entire 'Broken English' unit, generated her own notes, and written them in a format that would facilitate self-testing. However, the limited amount of material Claire had included, in relation to an entire unit's learning, could lead to illusions of competence.

In the epistemic awareness criteria, I evaluated this strategy at the Adequate/Emulation level. I evaluated it at the Substantial/Self-Control level for surface/deep strategies, as the headings and information Claire had included indicated that she was aiming for conceptual understanding rather than 'rote' facts. However, I rated it 2 for each of the other criteria. Without further examples or suggestions of how she might monitor her learning, Claire had not demonstrated 'multiple standards for knowing' or awareness of multiple perspectives, the uncertainty, ambiguity and incoherence of complex knowledge. She had also not demonstrated awareness that a complex task (reviewing an entire unit in preparation for an examination) may require a deeper strategy, aiming for the development of more rigorous content knowledge and practising the skills she would need, as well as reviewing the content.

4.2.3.ii Evaluation of work samples submitted by a high self-regulator with learning difficulties (Samantha)

‘Excellent/Self-regulated’ quality strategy

The first work sample Samantha submitted was an essay she had redrafted, based on her teacher’s feedback, after her mock English examination. I evaluated this strategy as Excellent/Self-Regulated for cognitive awareness because it involved SMART cognitive processes and was appropriate for the purpose of improving her examination performance. Because Samantha had redrafted an analytical piece of writing, this strategy also demonstrated evidence of task complexity. In terms of her understanding, Samantha initially struggled with evaluating her performance in relation to task criteria, but through her use of this strategy her own task calibration had improved. *‘[My teacher] gave me feedback on my mock exam... I’ll just keep reworking it until it’s a 7.*

I also evaluated Samntha’s redrafted essay as Excellent/Self-Regulated in the metacognitive awareness criteria. Reworking it until it achieved a 7 indicated the creation of ‘desirable difficulties,’ and submitting it for feedback suggested that Samantha was compensating for her weaknesses and avoiding illusions of competence. Self-initiated formative assessment had helped her use strengths (proactivity and effort) to overcome a weakness (poor task calibration). *‘This was a really useful activity for me because I saw where I went wrong... I could tick off all of his comments.’*

I also evaluated this strategy as Excellent/Self-Regulated for epistemic awareness. Using her teacher’s feedback to redraft her essay was a deep strategy that enabled her to develop rigorous content knowledge and conceptual understanding, promoted long-term retention, and gave Samantha an opportunity to hone task-specific skills. It also indicated awareness of the variability of knowledge, in other words that complex tasks, such as preparing for an essay examination, require deep strategies.

Image 5: English essay redraft based on feedback

Q2.

'In Diamond Square' is a novel by Mercè Rodoreda translated by Peter Bush from the Catalan into English. 'Top Girls' is a play by Caryl Churchill. 'In Diamond Square' is set in Barcelona in the 1930s during the Spanish Civil War. 'Top Girls' is set in the 1980s, in a time of change, when Margaret Thatcher had become the first female Prime Minister in the UK.

Both books discuss the disadvantages women have both in their society and culture. This essay will examine both books, one and then the other, and then will come to a conclusion.

Rodereda's personal views on women and their role in society and her own experiences are reflected in her book. Rodereda was unusual as she could read and write; however she was pulled out of school young and then she married her uncle and he was much older than her. She eventually left him and took her only son with her. Her own experiences are reflected in the protagonist of Natalia.

In both works women are the protagonists. Natalia is a wife and mother who is trying to keep her family together during times of difficulty particularly caused by the Spanish Civil War.

Natalia as a young woman passes herself from one man to another. At first, she has a fiancé called Pete but she leaves him to go off with Joe who becomes her husband. From the beginning of the book Joe is very controlling over Natalia and even physically violent towards her. Joe accuses Natalia of seeing her old fiancé Pete and Natalia denies this. Joe becomes very angry and grabs her by the neck and shakes her. After three weeks of not

As usual, this essay shows a great amount of preparation and very careful revision. You display your customary depth of contextual understanding and bring independent learning to bear on your discussion. Your understanding and knowledge of both texts is precise and you have a great control over plot and character details. You should be getting a 6 in this paper, and, I feel, overall at SL in this course. But you still need to work on refining your analytical skills and your ability to write argumentatively. This essay, much like Paper 1, consists largely of summaries of the plots of both texts, with elements of analysis thrown in. You have several short paragraphs, some as short as one line, and with some oddly large gaps between paragraphs. This leads to a disjointed feel, where each paragraph summarise a different moment, rather than naturally connecting to each other in the development of an argument. You need to establish an argument in your introduction, which should be in response to the exact terms of the question. This question asks you to consider 'to what extent' the texts display misogyny, so take a position on this issue and make this argument across your essay. Then, instead of using the chronologies of the texts as your organising principle, use the development of your argument. Take your reader step by step through your argument, using evidence from the text to back you up. At the moment, you summarise an issue and then analyse it a little. Instead, you need to analyse an issue and use evidence from the books to support you. Keep up the hard work, it will pay off, and with the extensive writing of past papers we will undertake after half term, you will get more attuned to these essay writing skills.

Moreover, submitting it to her teacher suggested awareness of multiple standards for knowing and of the uncertainty and ambiguity of complex knowledge. Samantha also described adapting this strategy for other tasks, depending on her learning goals, suggesting an exploratory orientation. *'If I'm doing an English essay, I might bullet the key points... so in the first paragraph I would do this, and in the second I would do that, and the third paragraph and so on...'*

'Excellent/Self-regulated' quality strategy

The second work sample Samantha submitted was a table in which she compared two literary works. I evaluated this strategy as Excellent/Self-Regulated for cognitive awareness. Samantha had adapted this strategy to the task by focusing on comparative commentary skills and using subheadings such as authors' backgrounds, literary features, and themes. While reducing the amount of material to less than ¼ of the original number of words, she had also referenced quotations and pages numbers. Her table demonstrated recall, understanding, application, analysis, and evidence of task complexity and she had searched for information that met the standards and transformed the material into a new representation, demonstrating SMART processing.

I also evaluated this strategy as Excellent/Self-Regulated for metacognitive awareness as it demonstrated the generation, spacing, and testing effects. *'[When revising with my friends], we go, "Tell me about the author's history?" and then we tick off what was in there.'* Using her table in this way also suggested that Samantha was avoiding illusions of competence. Samantha also found this strategy very reliable. *'If I'm writing a practice essay... I can just go to the boxes and tick off what's in there and plan from this document.'*

Image 6: Table comparing Top Girls and In Diamond Square

In Diamond Square	Top Girls
<p>Author's background Merce Rodoreda Born 1908 Barcelona. No higher education. Married young, possibly to an uncle. One son</p>	<p>Author's background Caryl Churchill Churchill's work is reflective of the time in which she lived. Born in London in 1938. Moved to Canada age 10. Family returned to England in 1955, and soon after she went to study at Oxford University. Married at age 23. Three sons.</p>
<p>History (& religion) as setting Lived through the Spanish Civil War of 1936-39 and she must have been affected by the poverty and deprivation caused by the war. 63, 102 J Ferdinand & Isabella 'put us on the right road'.8 'Poor Mary' 8 9 carpenter like saint Joseph' & N like Mary. 'cot for baby' 17 'baby's bedroom'. 9 kiss 'saw Our lord hovering ...Our Lord opened wide his arms'. 12 J's mother has Christ on cross above bed. J's mother asked N 'do you like housework? 63 'Republic came' J waving flag.' Ref to king & queen. 72 'rich were angry with the Republic'. 103 J joins militia. 110 'running around the streets'. 111 Blue boiler suit - uniform of militia. Revolver and double-barrelled shotgun. 111 'grocer's downstairs soon cleaned out' no food in shops. 113 militiaman threatens employer. Mistaken for a priest. (church supported Nationalists). 113 Five militiamen enter employer's house. Gun to head. Made to sign document handing over house to tenants. 115 Mrs E concerned money in bank worthless. 115 J, M & E help 116 J goes to Aragonese front. Father John escape. 117 Who is Mary? 119 J brings food.. Takes mattresses. Trenches. 130 J turns up with seven militiamen. Loaded with food mostly given by farmers. 136 ref to sirens. J & E dead. Watch. Death of last pigeon. 139 dinner shared by three - one sardine and mouldy tomato. 140 neighbours raided a warehouse. Mrs E brings food</p>	<p>Social and political context Churchill would have lived through WW2 (possibly while living in Canada). Lived in England after the war and saw the effects of destruction and deprivation. Churchill (and Brecht) committed to socialist politics (Marx critique of capitalism) Socialist playwrights aimed to mobilize the public by portraying working class communities and highlighting the disparities between rich and poor Art and political implications – political art is general against status quo. CC critical 'top girl' such as Marlene and Margaret Thatcher. Marlene reiterates Thatcher's view as 'no such thing as community' The first employment interview shows CC critical of Bourgeois feminists. Waitress does not talk - Bourgeois feminist Act 1 – First scene historical 'top girl' celebrate a contemporary characters success – do not gel as a group this scene suggest lonely at the top – competing with other women. 'girl' – in the title CC alludes to the patriarchal - women permanently juvenile 'clever girls' at dinner party and the 'tough birds' at employment agencies have taken on these role into their identity Marlene suggested working against the women she is supposed to be helping getting jobs Argument between Marlene and Joyce --. Represents the culmination of the political drama. Joyce see the world as being 'us' and 'them'. Marlene's optimism "I think the eighties are going to be stupendous" Joyce challenges Marlene's praise of Thatcher 'fascist' Marlene sees Thatcher as a 'tough bird'</p>

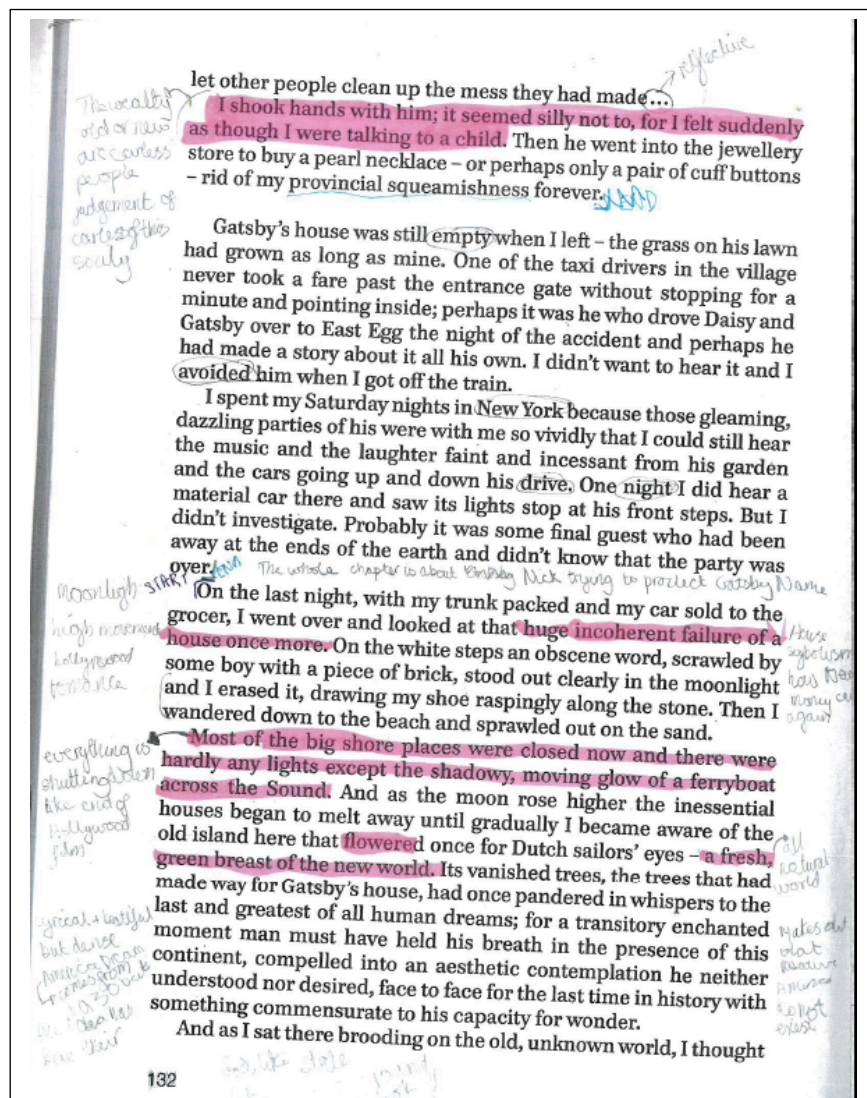
I evaluated Samantha's table strategy as Excellent/Self-Regulated for epistemic awareness. Inventing her own deep strategy indicated an exploratory orientation and including multiple examples under each subheading and using this strategy to write practice essays to submit for feedback indicated awareness of multiple standards for knowing and of the uncertainty and ambiguity of complex knowledge. Moreover, using a deep strategy to prepare for an essay exam suggested awareness of the variability of knowledge, and Samantha's engagement with teachers and peers to ensure accurate task

calibration demonstrated she was supporting her own judgements with reasoning and evidence.

‘Excellent/Self-regulated’ quality strategy

For her third work sample, Samantha submitted a highlighted, annotated passage from ‘The Great Gatsby’. I evaluated this strategy as Excellent/Self-Regulated for cognitive awareness. Highlighting and annotating literary techniques and themes was task-appropriate and involved SMART cognitive processes. Because Samantha was

Image 7: Great Gatsby annotations



analysing text, rather than trying to comprehend it, her implementation of this strategy also suggested evidence of task complexity according to Bloom's taxonomy.

I also evaluated this strategy as Excellent/Self-Regulated for metacognitive awareness. Samantha was aware of her strengths and weaknesses and thus read the text while listening to her audio book, pausing to make analytical annotations in the margins. Generating annotations, as part of the triple modality of this strategy (listening, reading and writing) reflected the creation of desirable difficulties. Furthermore, Samantha's focus on literary techniques and themes reflected an emphasis on relevant, rather than high interest but irrelevant details. Including this information in the table previously described, using it to write practice essays, and discussing it with friends suggested a high level of metacognitive monitoring.

I evaluated Samantha's highlighting/annotating strategy as Excellent/Self-Regulated for epistemic awareness. Analytical highlighting and annotating was a deep strategy that enabled her to develop rigorous content knowledge, conceptual understanding and an appropriate text-analysis skill, indicating an awareness that complex tasks, such as literary analysis, require deep strategies. Moreover, Samantha identified quotations to support her interpretations, suggesting an awareness of multiple standards for knowing as well as awareness that reasoning and evidence must be provided to support knowledge claims. Her independent use of this strategy demonstrated an exploratory orientation, as interview data indicated that students in this context often waited for the teachers to tell them what to annotate during class discussions, rather than doing so independently.

‘Excellent/Self-regulated’ quality strategy

Image 8: Audio book



The fourth sample that Samantha submitted, a photocopy of the cover of one of her audiobooks, did not reflect cognitive or epistemic awareness, but I evaluated this strategy as Excellent/Self-Regulated for metacognitive awareness. In the creating desirable difficulties category, Samantha listened to the book multiple times, suggesting she was avoiding illusions of competence. *‘I listen to [audio books] about 20 times before I sit the exam, so I know them inside out, back to front.’* This strategy also reflected metacognitive monitoring, particularly monitoring of the reliability of this strategy, effort, the pace of her learning, and her confidence. Samantha was also very much compensating for a weakness (reading) with a strength (listening).

4.2.3.iii Evaluation of work samples submitted by a high self-regulator in the high-achieving quintain (Ally)

‘Excellent/Self-regulated’ quality strategy

The first strategy Ally submitted was a highlighted and annotated newspaper article she had read for Geography. I evaluated this strategy as Excellent/Self-Regulated for cognitive awareness. Ally searched for information that corresponded to the Geography case study standards, monitored the degree to which the information corresponded to those standards, linked this information to other articles on the same topic, and translated the information into a new representation, demonstrating SMART cognitive processes. *'If I'm making one point about armed conflict, I can bring in two examples [which] impresses the examiner.'* As annotations were organised by Geography case study criteria, this strategy is appropriate for and adapted to the task. Ally's annotations also reflected sound understanding of the 'Famine' topic and she had reduced the number of words to $\frac{1}{4}$ or less of the original text.

I also rated Ally's Geography article as Excellent/Self-Regulated for metacognitive awareness. She created desirable difficulties and avoided creating illusions of competence by reading, highlighting and annotating multiple articles on the same topic. *'Different newspapers will have different opinions, so it's better to make sure, rather than focusing on one single newspaper.'* Ally's implementation of this strategy also reflected high levels of metacognitive monitoring and awareness of her own strengths and weaknesses. *'In an exam, sometimes I'll forget a statistic on a single case study, but then I'll remember one from a different country... so what I do is have knowledge from different case studies.'*

Ally's Geography article was also evaluated as Excellent/Self-Regulated epistemic awareness. It involved critical thinking and elaboration, suggesting awareness that deep strategies promoting rigorous content knowledge, conceptual understanding and long-term retention are most appropriate for complex tasks, such as case studies. Furthermore, drawing from several articles indicated an emphasis on multiple standards for knowing, awareness of the uncertainty, ambiguity and incoherence of complex knowledge, and awareness that interpretations should be backed with reasoning and

Image 9: 'Famine' article for geography case study

BBC Home News Sport Weather iPlayer TV Radio CBBC

Home UK World Business Politics Tech Science Health Education More

World Africa Asia Australia Europe Latin America Middle East More

South Sudan no longer in famine

21 June 2017 Africa

f t i+ Share

ALBERT GONZALEZ FARRAN

There has been an increase in humanitarian assistance since famine was declared in February

South Sudan is no longer classified as being in famine following an increase in aid, a UN-backed report says.

However, the report warns that the situation remains desperate as the number of people at risk of starvation has increased in the last month.

The famine, announced in February, was the first to be declared anywhere in the world since 2011.

Armed conflict, low harvests and soaring food prices have been blamed for the situation.

Tens of thousands of people have died and millions displaced since fighting erupted in the country more than three years ago.

- Africa Live: BBC news updates
- What is famine?
- The wooden bridge between death and safety

The Integrated Food Security Phase Classification (IPC) report says that 1.7 million people are still facing emergency levels of hunger, one step below famine.

The IPC adds that the number at risk of starvation has increased to six million, up from 5.5 million last month.

"I do urge caution, as this does not mean we have turned the corner on averting famine," UN humanitarian chief Stephen O'Brien told a meeting in Geneva.

"Across South Sudan more people are on the brink of famine today than were in

Causes

- Armed conflict
- Low harvests
- Soaring food prices

Consequences

- tens of thousands of deaths
- million people still facing emergency levels of hunger
- six million at risk of starvation

Solutions

- Increase in aid
- bags of sorghum airdropped to remote parts of the country
- pressure on the government

but with aid always a risk of dependency

Successful

no longer meet the technical definition for famine

but risk of reduced humanitarian aid

civil war still going on

six million still struggling to find food daily

evidence. 'One newspaper might say armed conflict was the reason for the famine, whereas another one might say, actually, there were low harvests that year.'

‘Excellent/Self-regulated’ quality strategy

I also evaluated the second work sample Ally submitted, a transcript of an Economics essay she had dictated into her phone, as Excellent/Self-Regulated for cognitive awareness. She had used this strategy to improve her Economics essay writing skills, and she had ensured that her essay corresponded closely to the standards by including definitions, examples, and graphs. As she dictated her essay from memory, this strategy also reflected Ally’s ability to remember as well as to understand, apply, analyse, evaluate and create.

I also evaluated this strategy Excellent/Self-Regulated for metacognitive awareness. By dictating from memory Ally practiced retrieval. She further avoided illusions of competence by generating her own notes and printing the transcript to revise later, indicating a dual code presentation. Ally’s emphasis on efficiency and awareness of her own strengths, weaknesses and learning preferences were particularly striking. *‘I don’t like to write essays when I’m practising for exams because it’s so time-consuming. I like to have conversations as if I’m explaining something to someone... when I’m revising, I can go over this transcript.’*

Ally’s transcript was also evaluated as Excellent/Self-Regulated for epistemic awareness. It was a deep strategy in that it involved analysis, evaluation, and the application of rigorous content knowledge, suggesting awareness that complex tasks, such as an Economics essay, require deep strategies. It was also inventive, indicating an exploratory orientation. Furthermore, describing high prices resulting from collusive oligopolies as a disadvantage and the innovation in terms of pharmaceutical development as an advantage, this strategy demonstrated an emphasis on multiple perspectives as well acceptance of the ambiguity of complex knowledge. Moreover, Ally’s planned inclusion of graphs indicated awareness that interpretations should be supported through reasoning and evidence.

Image 10: Economics essay transcript

Transcript of Oral Recording:

Should governments have laws preventing oligopolies?

A collusive oligopoly is a group of firms that meet to arrange and fix prices at a higher level than the equilibrium to ensure abnormal profits in the long run.

Include the monopoly diagram showing abnormal profits

Collusive oligopolies work in the same manner as monopolies in the sense that they all agree on fixing a price they can all make abnormal profit in the long run and therefore are neither allocatively nor productively efficient. This is a huge disadvantage to society who face a welfare loss due to a lack of resources being distributed in the most efficient way, especially scarce resources. However a major advantage could be the fact that with these long run profits they can invest in research and development. For example, in the pharmaceutical industry there are quite a few firms that work together to spike the prices and therefore they can actually undergo research and development in order to bring life saving drugs onto the market. Society benefits through this innovation as the government does not have to invest in this at an opportunity cost and instead reaps the benefits.

However there is an issue, which is the fact that if the price is so high, low-income consumers will not be able to afford the drugs or will spend a high proportion of their income on these drugs. This is due to the PED as life-saving drugs are a necessity and thus are inelastic. Oligopolies will take advantage of this and make a huge profit because they know that they can increase the prices and quantity demanded will be fall by a less than proportionate amount. Thus, total revenue earned increases.

However there is stated that pharmaceutical firms actually spend more on marketing than investment for example Novartis and Merck have higher percentages. This proves that actually the government shouldn't allow all of this collusive oligopolies to occur.

Maybe it would be good to also include the kinked demand curve.

In terms of the kinked demand curve, oligopolies if they do not collude will have a certain price level which they will sell at, which tends to be high anyway because even though they don't collude they still may follow the leader or they just compare the price to other ones. They stay at a certain price because they know if they decrease the price then all their competitors, which are other oligopolies, will see this and will also lower their prices which, may result in a price war. If in contrast they increase the price they will just lose of consumers as there are substitutes, which consumers can turn to. So they will stay at their relatively high price level which may still earn them abnormal profits despite not officially colluding.

OPEC can also be considered because it is a legal cartel. Then I can go into detail about how OPEC works and to an extent is useful.

Also focus on law preventing oligopolies-are they effective?

Use the case study example of Henkel and P + G and how the government only found out because Henkel came forward themselves. Is it a waste of resources and come at an opportunity cost to have these oligopoly watchdogs?

'Excellent/Self-regulated' quality strategy

The third work sample Ally submitted was a time management and motivation strategy. I did not rate this strategy for cognitive or epistemic awareness but evaluated it

Excellent/Self-Regulated for metacognitive awareness. The pink sticky on the left included upcoming work, deadlines, important events, and topics she planned to revise, listed in order of urgency. The blue sticky included tasks completed in Grade 11. *'[This] motivates me because I'm like wow, if I can get through Grade 11... I can do this.'* On weekends she adapted her strategy. *'I'll take out a piece of paper and write down everything I have to do on the Saturday and Sunday, and I tick off every time I do something.'* Ally's time management strategy indicated awareness of her strengths and weaknesses. *'If I'm trying to procrastinate, I'll have it there as a reminder, like, you need to work.'* It also reflected creation of desirable difficulties, including spacing study sessions and interleaving topics such as urban deprivation, crime, and immigration.

Image 11: Laptop screen



‘Excellent/Self-regulated’ quality strategy

The fourth work sample Ally submitted was a past paper text she had annotated. This strategy was evaluated as Excellent/Self-Regulated for cognitive awareness. Highlighting and annotating was appropriate for Unseen Commentary preparation, reflecting SMART cognitive processes. Also, Ally had identified a wide range of literary devices including alliteration, personification, hyperbole, and sensory imagery, demonstrating task complexity according to Bloom’s taxonomy and indicating sound understanding in relation to subject-specific criteria.

In terms of metacognitive awareness, this strategy was also evaluated as Excellent/Self-Regulated. Ally’s implementation of this strategy indicated creation of desirable difficulties and avoidance of illusions of competence. *‘I print both the prose and the poem because we get a choice, and I’ll attempt both to see if in an exam I’d be able to answer both and to develop the skills and challenge myself.’* I also rated this strategy 4 for metacognitive monitoring, particularly reliability of the strategy, pace of learning, and confidence. *‘I’ll give myself around 15 minutes, because that’s how long I usually spend in the exam. I’ll read it a few times to really understand it, and then I’ll pick out the key themes, the key ideas, and the literary devices.’*

Ally’s highlighted, annotated text was also evaluated as Excellent/Self-Regulated for epistemic awareness. She had used a deep strategy, involving analysis and application of rigorous content knowledge and appropriate skills to prepare for the Unseen Commentary, a complex task. This strategy also reflected an exploratory orientation. *‘I only recently started this strategy... I found this on my own.’* Moreover, Ally had underlined quotations associated with literary devices she had identified, suggesting awareness of a need to provide reasoning and evidence to support her interpretations.

Image 12: Annotated English past paper passage

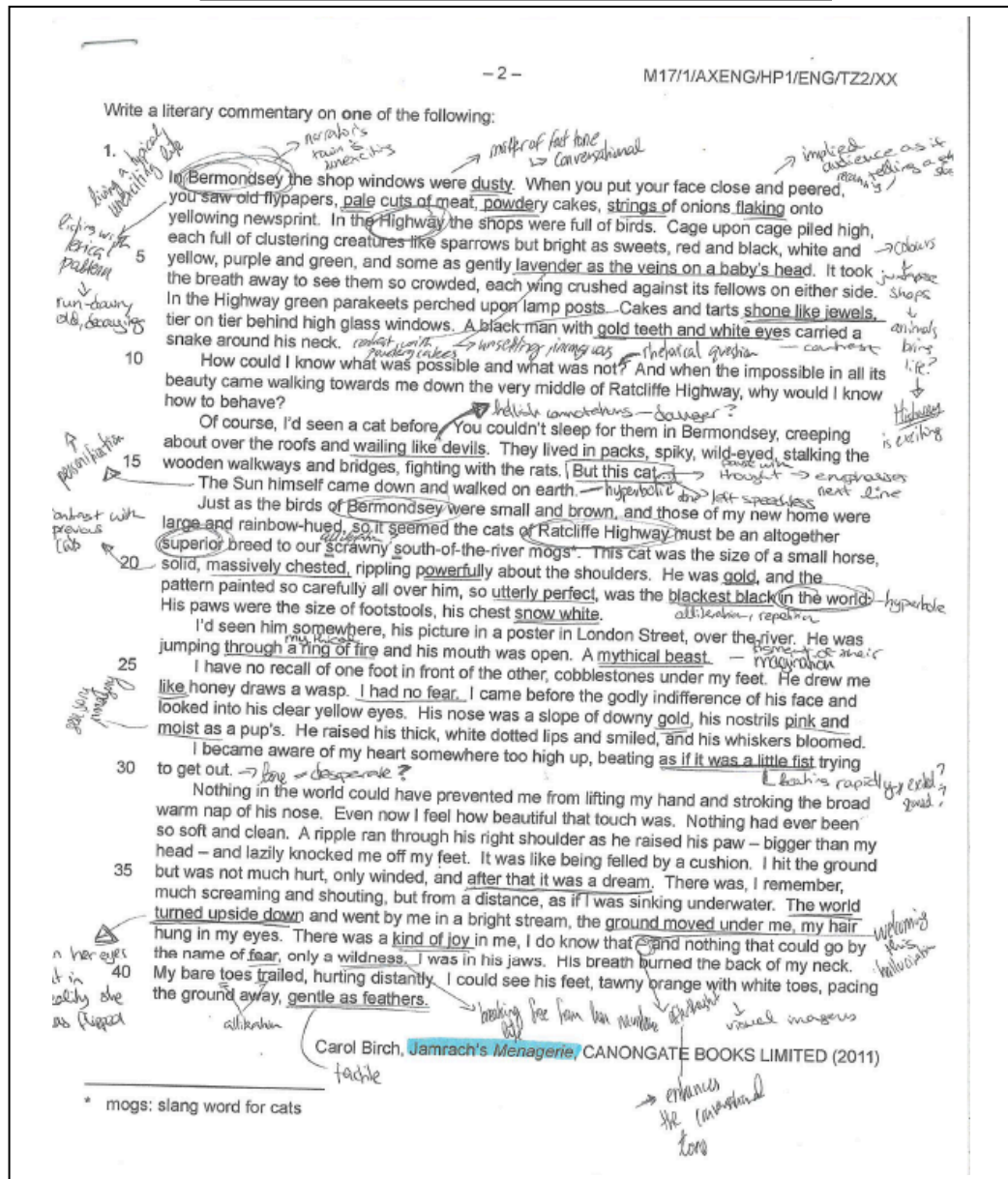


Table 8 (below) summarises the number of participants at each developmental level, based on holistic SRL ratings averaged from all displays corresponding to case study data.

[Table 8: Number of participants at each SRL developmental level]

	Observation	Between Observation and Emulation	Emulation	Between Emulation and Self-Control	Self-control	Between Self-Control and Self-Regulation	Self-Regulation
Grade 11 participants with LD (n=2)	0		1		0	1	0
Grade 12 participants with LD (n=2)	0		0	1	0		1
Grade 11 high-achieving participants (n=3)	0		0		0	2	1
Grade 11 high-achieving participants (n=3)	0		0		0	1	2

Research Question 3: In this context, what teaching approaches do high-achieving IBDP students and those with learning difficulties consider to be ‘good teaching’? How do these relate to SRL-promoting teaching approaches identified in the literature and espoused by the IB?

Summary

Having described my findings in relation to Question 1 regarding the development of participants’ self-regulation and Question 2 regarding differences in the strategies they used, I now turn to the findings in relation to Question 3. There were three teaching practices that nearly every participant considered to be ‘good teaching,’ all of which the literature suggests are SRL-promoting practices. These included teaching that afforded participants opportunities for discussion, critical thinking, and

active engagement in learning; an assessment culture that emphasised formative assessment; and a focus on process. No participants in this study described a purely didactic approach as ‘good teaching.’ In fact, five of ten participants directly contrasted their views of good teaching with aspects of didactic teaching.

Although there were no differences between what high-achieving participants and those with learning difficulties considered to be ‘good teaching,’ there were subtle differences in the reasons underpinning these perspectives. With regard to teaching that actively engaged them in learning, two of four participants with learning difficulties reported that they learned better this way, while one reported both learning from and enjoying this approach. On the other hand, all six high-achieving participants reported enhanced learning, enjoyment and interest to be benefits of teaching that actively engaged them in learning. With regard to formative assessment, all participants with learning difficulties tended to consider this approach helpful in ensuring they were on the right track in early stages of their learning and, in later stages, they relied on formative assessment to help them meet increasingly high criteria. Five of six high-achieving participants viewed formative assessment as ‘good’ teaching for the same reasons, although their ‘starting place’ may have been more advanced. Finally, with regard to process-focused instruction, three of four participants with learning difficulties described this approach as making learning more manageable, while five of six high-achieving participants described this approach as making learning more effective and efficient and only one also described it as making learning more manageable.

4.3.1 ‘Good teaching’ involves opportunities for active engagement, critical thinking and discussion

Participants with learning difficulties

Samantha and Chloe primarily described how being actively engaged during lessons helped them learn. Samantha, for example, said she learned best through class discussions. *'The way I learn best actually is class discussions.'* Chloe described how active engagement promoted retention. *'[My maths teacher] links the learning with the doing, because if you do exercises right after you learn it's easier to remember it... it just doesn't stay in your head if you didn't practise it.'* Claire really enjoyed class discussions but also appreciated the opportunities they afforded her to develop her own ideas. *'I find English so much fun... we will read a passage and our teacher will say... 'What do you guys think?' So, we, students, have an opportunity to develop our ideas.'* She further explained, *'when maths gets lectured to me, I get really bored... what's the point of us watching you put it on the board?'*

High-achieving participants

Sarah described how a purely didactic approach learning inhibited her learning. *'In my [science] class we just do content, content, content. If you're constantly hearing new concepts... towards the end, I'll realise I've not understood that anymore. I think there should be a balance between the actual taking and the doing... I find that really helpful.'* Piper also valued opportunities for active engagement. *'I think engagement with the student is something that's really important, not just a teacher talking at you for 45 minutes.'* She especially enjoyed being able to engage in independent thinking and problem-solving activities before class discussions. *'Our teacher will make a little question pack [with]... different sources we can analyse... when you come into class you feel prepared to discuss it with everybody, and you get to hear everybody else's opinion.'* Annabelle, too, preferred hearing her classmates' perspectives, rather than just her teacher's. *'It's really useful if we have multiple points and perspectives so we can have a more wholesome picture, not just one perspective.'*

Ally, on the other hand, viewed active engagement as superior exam preparation. *'I prefer to challenge myself to think because in the IB, that's what you have to do. When you get a question, you can't remember what your teacher is going to think about it. You have to think, how am I going to approach this?'* She also believed that good teachers allow their students to explore approaches to learning that work for them, rather than engaged in a top-down telling. Eliza, too, did not want her teachers, to dictate to her how to go about her learning. Eliza particularly relished the opportunity to grapple with the skills associated with particular professions. *'I think that's really important... that the teacher allows you to try it out for yourself. If it doesn't work, fine, it doesn't work. But at least you're being the learner, taking the risks, behaving as a researcher in that field would behave.'* Karen, on the other hand, lost interest during lectures. *'In English, all we do during class is listen and take down what the teacher's saying.... for me, it doesn't work because I tend to tune out.'*

4.3.2 'Good teaching' involves formative assessment

Participants with learning difficulties

Ongoing formative assessment contributed to Chloe's sense of well-being in class. *'[My teacher says,] "Oh, so you're all aware of what that means? Oh, so I see you're rolling your eyes!" He's asking us how we are doing right now, and it's really good, because then everybody feels safe actually.'* For Claire, formative assessment drove her learning forward. *'I'll have an opportunity to be like, "well, I think when Brabantio says this, he's talking about this..." and [our teacher will] be like, "you could read it as that, and some people read it in this way." So... even if it's not necessarily a correct reading, at least we've progressed our own ideas.'* Formative assessment of Samantha's first geography essay gave her a good sense of how to write a Geography

essay. *'[My teacher's] feedback was really helpful, and it was a really good learning thing about how to write a proper Geography essay.'* Daily formative assessment in mathematics helped Hannah better understand and address her weaknesses. *'We do little tests, individual tests, and there's an answer sheet at the back so we can check it when we're done. It's really helpful because I understand what my weaknesses are.'*

High-achieving participants

Sarah described how formative assessment helped her monitor her learning. *'If the teacher is talking us through something, there should be a plenary, a worksheet... or a quick quiz, quick questions to make sure you've got the concept in application.'*

Annabelle suggested that formative assessment would help her improve her textual analysis skills. *'Teachers and examiners won't really comment on our annotations, and I think that would be useful if they did... because it's the foundation of our essay.'* Karen explained why her current mathematics teacher's ongoing, informal formative assessment was preferable to the approach taken by previous teachers. *'I've had three teachers in the IBDP, and one teacher's approach has clearly been the best... [he] puts us to work and he'll go around and sit with everyone individually, talk about what they didn't understand, talk about what they did understand, and go through the questions.'*

Eliza submitted papers to her teachers and exchanged them with peers for formative assessment to ensure she was maximising her potential. *'I give some of my essays to my teachers to mark for me. I sometimes exchange it with another student to mark it for each other.'* Ally, in Grade 12, wished that her teachers would have set more past paper practice earlier in the course so she would have developed a habit of completing past papers earlier.

4.3.3 'Good teaching' involves process-focused instruction

Participants with learning difficulties

Chloe suggested that teachers should support their students' time management in order to help reduce stress. *'Teachers should give you time to note [important dates] down in your planning calendar... [otherwise] you're really paranoid that you're going to forget.'* For Claire, past paper practice contributed to a sense of efficacy. *'I like that she's obviously intentionally trying to show you that if you're good at this, you can clearly be good at something that's actually on the exam.'* Samantha's geography teacher had scaffolded the writing process by teaching her the acronym 'PEEL' and encouraging her to colour-code her first essay, which helped her remember the structure for essays in this subject. *'Because I've colour-coded it once I [still] know the point, the explanation, the evidence, and the link.'* Being prompted to highlight and annotate supported Hannah's reading comprehension. *'My teacher told me to always annotate and highlight... when you highlight and annotate, it's really easy to understand and go back and study.'*

High-achieving participants

Sarah described the positive impact on her sense of well-being of her mathematics teacher's system of scaffolding her Maths homework to support her time management. *'Rather than setting us a huge chunk of questions, he'll say, those are your Thursday night questions, those are your Friday night questions, Saturday night, and Sunday night... if you follow that, you don't feel as overwhelmed, whereas if you save it for Sunday, then...'* For others, though, process focused instruction enhanced the effectiveness and efficiency of the way they approached learning. For example, Annabelle described how her English teacher scaffolded her textual analysis process,

which helped her to approach the analysis of poems more effectively. *‘He was like, okay, for the first reading... just have a general gist and for the second reading, start to pick out different themes, imagery, where it’s used, and things like that. So... the first time I [read] just to get the gist, [then] I do multiple read-throughs.’* Ally, in Grade 12, described the efficiency of writing essay plans instead of essays. *‘Rather than just give us one essay to do, give us two or three essay plans. You can cover more content with a plan setting out how you’d go about writing the essay than just writing one essay.’* Table 9 (below) summarises the findings in relation to teaching practices participants described as ‘good teaching.’

[Table 9: Participants’ perspectives of ‘good teaching’ that emerged from the data aggregated by year group and quintain]

	Grade 11 HA (n=3)	Grade 12 HA (n=3)	Grade 11 LD (n=2)	Grade 12 LD (n=2)
Teachers who connect to their students on a personal level	0	0	2	0
Opportunities for active engagement, critical thinking and discussion	3	3	2	1
Providing extension material	1	0	1	0
Enjoying the subject him or herself	0	1	1	0
Formative assessment	2	3	2	2
Process-focused instruction	2	3	2	1
Being organised and well-prepared for lessons	0	0	0	1

RESEARCH PHASE TWO: FOCUS GROUPS

Research Question 4: In this context, how important do high-achieving IBDP

students those with learning difficulties think it is for teachers to teach them

Approaches to Learning skills?

Summary

Having described the findings in relation to the first three research questions, regarding development of participants' SRL, their strategy use in the IB Diploma Programme, and their perceptions of 'good' teaching, this chapter now turns to a discussion of the findings in relation to Research Question 4. Perspectives regarding each ATL skill are discussed in the following subsections: Research skills, Thinking skills, Self-management skills, Affective skills, Collaboration skills, Reflection skills, and Communication skills. The perspectives of participants in the learning difficulties focus group and of those in the high-achieving focus group are distinguished in each subsection. Participants in both focus groups valued ATL skills as vital to success in the DP and agreed that it is important for teachers to explicitly teach these skills in the IB Diploma Programme, as well as in the MYP, contradicting teachers' assumptions regarding DP students' preferences highlighted in my IFS investigation (Forrest, 2017).

4.4.1 How important do participants think it is for their teachers to teach them

Research skills?

Participants with learning difficulties

Other than one MYP lesson during which they had learned about primary and secondary sources, Grade 11 focus group participants with learning difficulties could not recall being explicitly taught research skills. Instead, they suggested teachers assumed they knew these skills already. *'I think when I got [to this school] I was just expected to know that.'* However, some DP teachers had provided scaffolding to help them develop their research skills. *'Some of our teachers kind of guide us in where to find good research... in economics, [our teacher] will sometimes put links on the sheet itself.'* The Grade 12 participant indicated more of an explicit emphasis on research skills,

particularly in some classes. *'In Grade 12 I think they focus on how you use your sources, like reliability... [and] bias. You can't simply put across facts without knowing where you got it or who said it, because it will come off as your opinion... My [geography teacher] was very strict about what to do and what not to do, so that's how I learned.'*

All participants in the learning difficulties focus group agreed that it is important for DP teachers to explicitly teach research skills. *'It's very important because if we don't know how to research effectively, we cannot receive our IB Diploma.'* They also felt these skills should be emphasised more in the MYP. *'I didn't pay that much attention to it... I wish my teachers had called me out on it so I could have better habits now.'* They agreed that Grade 12 is late to learn research skills. *'[When] they teach it [in Grade 12] it's not [comprehensive] enough for us to know if our source is reliable, or if we're plagiarising without even knowing it.'* The Grade 12 participant suggested that explicit instruction of research skills might even help reduce stress in the DP. *'During the IAs it's a bit of a hectic time... once you get a plagiarism check and it's like 50% your initial reaction is to start freaking out... maybe teachers should pay more attention to [the] tiny details [pertaining to research skills] so that people don't get spooked out by that.'*

High-achieving participants

Two high-achieving participants agreed that research skills were not explicitly taught. *'It's more expected than it is taught.'* Like the Grade 11 participants with learning difficulties, they described receiving guidance from teachers, rather than explicit instruction. *'Certain teachers give you guidelines, like, okay, I want you to limit yourselves to let's say these types of scholarly sources.'* However, the other participant in this focus group contradicted this claim, at least for MYP teaching. *'The way*

[research] was taught [in the MYP] was quite analytical.' All agreed it is important for IBDP teachers to teach research skills. *'It's so important, because if the information you're finding is not valid, or relevant, nothing that you produce will be of the quality [the IB] is expecting.'* They also agreed that instruction should be on-going throughout the DP. *'It is a pretty important skill that I think needs to be focused on more.'*

4.4.2 How important do participants think it is for their teachers to teach them

Thinking skills?

Participants with learning difficulties

Grade 11 participants recalled little explicit instruction of thinking skills. *'There was that time we had a debate in English, and we were supposed to look at two sides of an argument... so I guess every now and then there will be an opportunity where they'll have you look at two sides of things. This year in ESS we did that as well.'* The Grade 12 participant, however, disagreed. *'Critical thinking is always part of the teaching here. You always have to consider both sides of the argument... every time we write an essay... that's training us to think in an evaluative way.'* All participants agreed that explicit instruction of thinking skills was important. *'My exam grades were lower in December because... a lot of the importance of the IBDP exam is thinking critically and looking at questions in different ways... I had to focus on how to think in the way the exam wants me to think, which added piles and piles more stress.'*

High-achieving participants

In this focus group, one participant suggested that TOK and IAs provided most of the opportunities for students to develop thinking skills. *'That is the point where... you're bringing something, rather than accepting something.'* Others felt that English

also enhances thinking skills. *'The style of discussion is very analytical... it's all about different interpretations.'* One student suggested that some students are naturally more capable of analysis. *'There is a very definite divide between people who are good at analysing... and people who just aren't.'* Yet, with guidance they had seen those with less developed skills improve. *'You see people who never had input before putting their hand up and saying things.'* Furthermore, while considering themselves effective thinkers, they agreed that explicit instruction was important. *'It's very important... I think that's what sets the DP apart from a lot of other qualifications.'* However, they did not want to be told how to think. *'It's not about teachers saying, "This is how you need to think..." [It's] more about saying, "Well, what does this make you think?" and letting you come about the thoughts and the analysis naturally.'*

4.4.3 How important do participants think it is for their teachers to teach them Self-management skills?

Participants with learning difficulties

Participants in this focus group could not recall being taught self-management skills, apart from their support lessons and occasional scaffolding in their DP classes. *'I only learned how to be organised through LRC... every now and then, a teacher will remember they're supposed to do that... [but] it's awkwardly inserted very, very rarely.'* However, some teachers emphasised self-management skills through process-focused instruction. For example, two teachers had provided calendars that laid out deadlines and work periods for all of their assessed work. *'That was so helpful for me as someone who finds it hard to look at the whole picture of coursework.'* The Grade 12 participant described the stress caused by a heavy workload. *'Teachers just expect you to... be good at that class [and] make sure you've done the coursework.... [but Grade 12] gets really*

hectic... I think most [Grade 11] students are under the impression that they can manage to do it in Grade 12 but then Grade 12 is so busy.'

All participants considered explicit instruction of self-management skills important. One Grade 11 participant explained, *'I'm aware that we're supposed to be independent... but we're teenagers. We're still learning. It's hard to become independent without a little bit of teaching.'* The other Grade 11 participant spoke of the stress that accompanies poor self-management. *'You have the weight of the world on your shoulders... a clear plan helps you sleep better and you can be more confident in your studies... if you don't have that plan, you feel like you're going to spontaneously combust.'* The Grade 12 participant agreed. *'[Teachers] should teach us how to be organised, because during IA season it's just tragic watching the Grade 12s.'*

High-achieving participants

The participants in this group laughed when asked how their teachers taught them self-management skills. *'You're laughing!'* They could not recall any explicit instruction of self-management skills but, given the workload, they had felt forced to develop these skills without instruction. *'It's just like, you keep getting hit... the amount of work you have, it's a constant stream. You have to adapt, and while I don't know if it's necessarily the most gentle way to get someone to be organised, I think I'm pretty organised now.'* They considered self-management skills hard to teach but explained how a process-focused approach helped. *'What some teachers do is say, "Okay, this is your task, these are some resources, these are some tips, you could break it down into these smaller tasks and conduct it that way." That is teaching you how to go about it.'*

The DP's heavy workload was often overwhelming, and high-achieving focus group participants felt they needed support. *'The biggest problem for people in our sphere, I guess, is that it's so overwhelming, you don't know what to do, you don't know how to start... [it] induces work load paralysis.'* They agreed that self-management

skills should be emphasised more in the MYP, as well. *'If it had been [taught] earlier it would be better for us now. Because if you have those skills embedded in you from the start, you're going to do better in the long run.'* However, what they wanted from their teachers was guidance, not necessarily explicit instruction. *'It can be offered as suggestions. "I noticed that you're having a few troubles. What's the issue?" I think you'd be restricting people by teaching it.'*

4.4.4 How important do participants think it is for their teachers to teach them

Affective skills?

Participants with learning difficulties

Participants in this focus group could not recall explicit instruction of affective skills by subject teachers but agreed that a supportive context, particularly a classroom environment in which they felt comfortable talking with teachers about their issues, helped. *'[Our teacher tries] to create an atmosphere so that you tell him, as opposed to feeling so bad that you have to lie... he wants to... make sure you're not in the same position [later].'* Support outside of class also enhanced these participants' well-being. *'[My teacher] commits a lot if you're struggling... she'll talk to you about how you can improve, how not to stress out, and how to plan and organise so that you're... able to submit all the coursework.'* Participants considered the most appropriate place for explicit instruction of affective skills to be Advisory, and even brief exercises had a positive impact. *'My advisor would be like "Who has tips for procrastination?" and we'd all share different ideas... I actually did learn some pretty great tips... I wish every advisor would do that, because it was really helpful.'*

High-achieving participants

High-achieving focus group participants laughed again when asked how teachers taught them affective skills. *'Do they! Some teachers do. Some teachers do not at all. Some teachers are very good at amplifying [stress].'* They agreed that the DP workload took a heavy, yet under-estimated toll. *'It's two separate facets of the IB, the academic side, and the emotional side. At times people forget about the impact that such a heavy workload has on a person.'* A content focus contributed to their stress. *'In my physics class, we just do content, content, content, and he's like, "you need to be practising on your own... I wish I could do more of this in-depth stuff with you, but we just don't have time." Because there's that pressure of getting the curriculum done, even more effort needs to be put in with this mental aspect.'* Although high-achieving participants could not recall being taught affective skills, they agreed that a supportive context helped. *'[Some teachers] say, "We're just going to talk everything out, discuss your stress, and [they] have given us things to do to alleviate stress and stuff like that, which is really good.'*

High-achieving participants agreed that explicit instruction of affective skills is important. *'If I had come... straight into the IBDP, I would not be coping.... I've done the IB since like birth, and it's still difficult. I think [affective skills] could have more focus placed on [them]. That would benefit the students.'* They also suggested a process focus might help them enjoy learning more. *'The focus is entirely on assignments and the subject [content], rather than the actual learning behind it... if you're not learning [the process], then you're not enjoying what you [learn]. If you're not enjoying [the subjects] you've picked for yourself, then, well, it's really hard, because you're just looking at the stressful aspect of it.'*

4.4.5 How important do participants think it is for their teachers to teach them

Collaboration skills?

Participants with learning difficulties

Grade 11 focus group participants could not recall being explicitly taught collaboration skills but noted that collaboration is part of the coursework in some subjects. *'In Drama we have the collaborative project [as] part of our coursework.'* The Grade 12 student described how collaboration was a feature of some her classes. *'For History we build essay plans [collaboratively] because... some people are stronger, some people are not, so when we do it together, especially for exam preparation... all of us are prepared... in Geography... [we] do mind maps and everybody gets up and looks around in the classroom, what they think they've learned that lesson. So most of it is like pure work, compared with the teacher just telling us everything. She'll put the question on the board and tell us to try it on our own first, and then she hands us articles at the end of the lesson. So, I guess self-learning is important, as well as [learning] with other people.'*

With collaborative work rare, Grade 11 had formed a grade-wide WhatsApp group chat. *'[Our WhatsApp group chat] has every single person in the grade, where people share messages... or put helpful links that were really great for a certain subject.'* Grade 12 had formed subject-specific social media groups. *'I think almost every subject has a group chat... because we have to keep working together. Otherwise it becomes really hard, near exams especially... we rely on each other in the DP.'* Nonetheless, these students did not believe that collaboration skills could be taught. *'It's not really a skill that can be taught that much... it's something you learn from experience.'*

High-achieving participants focus group

High-achieving focus group participants could not recall engaging in collaborative projects in the DP and felt that collaborative work could be a negative experience. *'A lot of the time in team projects it's kind of accepted that there's somebody who isn't going to do their work and there's somebody that's going to cover their work.'* While they could see why it might be hard to teach collaboration skills, they agreed it is important to do so. *'You will encounter situations where you will be working with people who might not be the best to work with, but you can [learn] different techniques... to make every collaboration as effective and as productive as possible... we could really use the time in the IB to learn that skill.'*

4.4.6 How important do participants think it is for their teachers to teach them

Reflection skills?

Participants with learning difficulties

Participants in this focus group could not recall being taught reflection skills. *'I was never taught how to make a reflection.... but, as you guys know, reflections are super important in the IB.... I struggled with reflection for quite a while.'* Two participants had taught themselves. *'I found on a website some starter questions... literally I would copy and paste the question, and then under each question I would answer it, depending on what the activity was.'* The Grade 12 participant had developed reflection skills through experience with the DP curriculum. *'In the Extended Essay you have to reflect. In some of the IAs you have to reflect... I think CAS is where you start... as you go to Grade 12, you have to reflect on almost everything.'* All agreed, however, that explicit instruction of reflection skills was important. *'I think it's quite important. They can be a bother to write, but once you do write them, especially for some subjects,*

they have been very useful in seeing what I can improve on... it would be a great skill to learn properly.'

High-achieving participants

Although they could not recall receiving explicit instruction of reflection skills, high-achieving focus group participants who had experienced both the PYP and MYP had grown to value this skill. *'The only reason that I now appreciate reflection is because it was like force fed to me for the past ten years.'* Reflection had enhanced their thinking overall. *'That reflective ability has influenced every other aspect of my thinking skills... it's really important.'* Opportunities for reflection had also enhanced their overall learning. *'It gives you a chance to look back on everything, and in doing that you're sort of consolidating your own learning... it's like a disorganised desktop, and then you get to put everything in folders.'* The participant who had arrived at the school in Grade 9, though, felt that reflection in the DP was not always meaningful. *'The amount... and the rate at which we're doing it... the quantity is sort of devaluing it.'* However, the others disagreed. *'I'm comfortable to knock out ten class reflections in one go, but at the same token I'm thinking about it as I'm doing it. I'm not just putting the words in there.'*

There was consensus that it is important for teachers to explicitly teach DP students reflection skills. *'For people coming into the IBDP from a different system, that would be incredibly difficult because your level of reflection is expected to be very high, and reflection is expected in every aspect of the IBDP.'* Informal opportunities to reflect were also appreciated. *'If we've had a really heavy lecture, then some teachers hand you a slip, like, what have you learned? What questions do you have after this lecture?'*

4.4.7 How important do participants think it is for their teachers to teach them

Communication skills?

Participants with learning difficulties

Grade 11 focus group participants recalled communication games in English, but otherwise perceived explicit instruction of communication skills as rare. *'The whole point was to see how few times you can say 'um' and 'yeah' and 'like' [because] when you're not using those words, your vernacular sounds more professional.'* The Grade 12 student, though, argued that every teacher teaches communication skills, particularly as part of the writing process. *'We're specifically taught how to write a conclusion... or we're taught how to write an introduction over and over during the year... so I guess that's an effective way of teaching students how to communicate.'* All agreed that explicit instruction of communication skills was important. *'It's quite important... if teachers use strategies to discuss things and improve people's general way of communicating, [it] would be helpful in life.'*

High-achieving focus group participants

High-achieving focus group participants agreed that communication is an element of the criteria in every subject, and that being given opportunities to have class discussions, write essays and give presentations, *'really brings up the standard of what we do.'* They agreed that TOK is an excellent environment for the development of communication skills. *'TOK is so great... you're talking about something that is so analytical and so engaging as a concept, that the only way to express what you're thinking about is to communicate thoroughly.'* There was consensus amongst high-achieving participants that it is important for teachers to teach communication skills explicitly. *'[Communication is] in every facet of life, not just in the IB DP. If you're thinking the thought, but you can't express it, what's the point in having it?'*

Conclusion

In the first part of Chapter 4, I presented the findings and analysis of the multiple case study phase of this investigation. Analysis ‘followed the data,’ integrating theoretical explanations rather than privileging a particular stance, thus preserving the complexity of SRL. Because this theoretical complexity and the large volume of open-ended, qualitative data generated by the case studies made concise reporting a challenge, illustrative examples, typically including relatively lower and higher self-regulators in each quintain, were drawn upon to illuminate the findings in relation to each research question. In the latter part of this chapter, I presented the findings and analysis of focus group data in response to Research Question 4. In the next chapter I discuss the utility of integrating the three relevant theoretical perspectives to preserve the complexity of SRL. I also explore three themes, each related to a different theoretical stance, and highlight the potential of student-centred teaching and explicit instruction of Approaches to Learning skills to enhance the development of SRL.

Chapter 5: Discussion

As a careful review of literature revealed no previous empirical studies that investigated self-regulated learning from an integrated lens drawing on social cognitive theory, information processing theory, and a situated model of SRL, I begin this chapter by discussing the utility of integrating these three perspectives to preserve the complexity of self-regulated learning. I then discuss three themes, each underpinned by a different theoretical perspective, that emerged from the data. These include the vital role epistemic awareness played in SRL, the positive impact of a ‘mastery by performance’ goal orientation on SRL, and the potential for teaching to enhance the SRL of students with learning difficulties. In discussing these themes, the potential for student-centred, process-focused instruction and explicit instruction of ATL skills to enhance the development of SRL is explored. Each theme is elaborated upon with illustrative examples from the previous analysis.

5.1 Integrated theoretical stance: Preserving the complexity of self-regulated learning in real educational contexts

The past four decades have seen the emergence of a number of SRL perspectives that overlap in fundamental ways, including constructivist theoretical underpinnings (Anyichie and Butler, 2015) and a recognition of the role of cognition, metacognition, emotion, motivation, and goal-setting in what is believed to be a dynamic, cyclical (Schunk and Greene, 2018) situated process (Butler and Cartier, 2018). Researchers from various traditions largely agree about what self-regulated learning is (Heikkilä and Lonka, 2006) and about the potential of a constructivist environment to enhance SRL (Azvedo *et al*, 2008; Patrick and Middleton, 2002; Winne,

2010; Schunk and Zimmerman, 2007; White and DiBenedetto, 2018; Butler and Schnellert, 2015).

Researchers also agree that the complexity of understanding SRL in context weaves a tangled methodological web (Hadwin *et al*, 2004; Meyer and Turner, 2002; Roll and Winne, 2015; Winne, 2010; Cascallar *et al*, 2006). Black and Wiliam (2009) argue that the ‘complexity of [particular] situations... can only be understood in terms of the several theoretical perspectives required to explore the different types of issues involved’ (p. 33). Järvenoja *et al* (2015) argue that contemporary theoretical perspectives, while foregrounding different aspects of SRL, are, in fact, complementary, and that the ‘different perspectives together can provide a comprehensive view on regulated learning’ (p. 216). However, theoretically integrated empirical research investigating self-regulated learning is rare.

One of the most salient understandings to emerge from this investigation, therefore, is the utility of adopting an integrated theoretical stance to understand self-regulated learning as a complex, dynamic approach that students develop 1) independently and with others 2) by adapting their strategy use to teaching style, subject, task, workload and the overall demands of the curriculum, and 3) depending upon individual-context interactions. While not diminishing the importance of investigating SRL as an event or series of events that unfolds over time (Winne, 2010; Hadwin *et al*, 2004; Patrick and Middleton, 2002), this investigation demonstrates that adopting an integrated theoretical perspective to explore SRL as an ‘approach’ can provide valuable insights to a deepening understanding of how SRL develops in particular contexts over time.

In this investigation, each participant’s SRL evolved differently, depending on what she ‘brought’ to her learning as well as how that interacted with this DP context (Butler and Cartier, 2018; Butler and Schnellert, 2015). Students ‘brought’ knowledge, strengths, challenges, teaching preferences, beliefs, values, and history (Butler and

Cartier, 2018; Butler and Schnellert, 2015) as well as the self-efficacy, motivation, and reflection foregrounded by social cognitive theorists (Usher and Schunk, 2018), and the cognitive, metacognitive (Winne, 2018), and epistemic awareness (Muis, 2007) foregrounded by information processing theorists. All of this interacted synergetically with the educational context, including teaching, workload, type of task, available support and with the wider context, including the expectations, pressures, and distractions that formed part of each student's overall experience, either supporting or undermining SRL within the Diploma Programme. Thus, a situated model of SRL served as an umbrella framework to which social cognitive and information processing theories provided important insights and clarification.

The congruence of ratings on the various displays supports this compatibility. After scrutiny and blind moderation, eight participants' SRL ratings achieved 85% agreement, and a satisfactory explanation for the two confounding results was obtained: The lowest-regulated participants' work samples holistic scores, while still lower than those of higher self-regulators, were inflated above their other SRL ratings due to the relatively well-developed cognitive and metacognitive awareness their work samples demonstrated. Notably, across-measure intra-rater reliability checking indicated that, overall, participants whose work samples reflected higher levels of information processing also generally demonstrated higher levels of self-efficacy, motivation, goal-setting, planning, self-monitoring, and self-reflection. They also 'brought' more to their learning from a situated perspective, such as higher levels of self-determination, ambition, or a history of adaptive work habits, than had participants with lower quality strategies. Four years of school report teacher comments analysed for each participant demonstrated that effective self-regulators had entered the DP as effective self-regulators, and less effective self-regulators had entered the DP with limited SRL.

While on a small scale, this congruence empirically supports theoretical overlaps between the three perspectives underpinning this investigation and suggests

that integrating these perspectives can, indeed, provide a comprehensive view of self-regulated learning. In this investigation, using an integrated theoretical lens to understand how SRL developed, the strategies students implemented, and how the teaching practices they regarded ‘good teaching’ related to SRL literature enabled me to follow the data where it led, focusing on the most salient aspects of SRL as they emerged from the data for each case, rather than privileging a particular theoretical stance. A comprehensive understanding of how the SRL of high-achieving IBDP students and those with learning difficulties had evolved thus gradually emerged from the data.

To further illuminate the compatibility of the theories underpinning this investigation, I turn to an illustrative example. Claire, who demonstrated the lowest overall levels of self-regulated learning, also demonstrated the lowest levels of SRL from each theoretical perspective as measured by the various displays utilised in this investigation. The situated model highlighted Claire’s dissatisfaction with ‘traditional’ teaching practices and illuminated how her history, limited self-determination and passive temperament contributed to learned helplessness and diminished her *inclination* to take advantage of support offered or regulate her own learning. Social cognitive theory, on the other hand, illuminated how low levels of self-efficacy for self-regulated learning and a mixed goal orientation were related to procrastination and ineffective planning, ‘reactive’ strategy use, and limited reflection and self-evaluation. Finally, information processing theory helped explain the varying quality of the strategies Claire implemented. These influences together appeared to have diminished the *effectiveness* of her attempts to regulate her learning.

To illustrate how inextricably intertwined the perspectives are when exploring SRL in a real educational setting, I now re-visit her case. From a situated perspective, Claire had arrived at the school two years prior to commencing the IBDP lacking a repertoire of effective strategies. At this time, she engaged in negative social

comparisons between herself and students who, in her view, were more competent strategy users than she was. She had routinely received sanctions for missing deadlines, and the teacher comments on her school reports between starting at the school and the commencement of this investigation indicated that her teachers attributed her poor performance to a highly passive approach. She was eventually diagnosed with a learning difficulty and started receiving support in the school's support programme which, like the Self-Regulation Empowerment Programme (Cleary and Zimmerman, 2004; Cleary and Platten, 2013), was underpinned by social cognitive theory.

Claire appeared to have latched onto 'ability,' particularly her learning difficulty, as a reason for poor academic performance. Despite learning a range of strategies to support her learning, if she did not believe she could achieve a 'perfect' result on a piece of coursework, she simply did not do the work. From a situated perspective, she also did not possess the self-determination needed to take ownership of and regulate her own learning (Butler and Schnellert, 2015), frequently deflecting blame for poor performance to teachers. In contrast with more highly self-regulated participants, Claire's interview data was peppered with comments that began, "No one told me..." while more highly self-regulated participants came across in the data as far more proactive.

Moreover, Claire did not fully take advantage of supportive contextual features, further demonstrating limited SRL. Azvedo *et al* (2008) argue that the ineffective self-regulators in their study rarely asked for help, and this was the case for Claire. More highly self-regulated students, aware of their strengths and their limitations, frequently spoke of exchanging papers with peers, submitting work to teachers for formative assessment, taking advantage of scaffolding and/or extensively utilising assessment criteria in order to ensure they were working to their potential. Claire did not report engaging in any of these practices.

Claire was involved in the school's support programme for roughly two years by the time this investigation began. From a social cognitive perspective, she had been taught a repertoire of strategies which she described as helpful, and her self-efficacy for self-regulated learning had gradually improved. However, Butler and Schnellert (2015) argue that many students with learning difficulties who receive strategy instruction fail to become 'independent, *self-regulating learners*' (p. 136). Claire remained inconsistent in her strategy use throughout her first year in the DP, engaging in some tasks superficially, reactively (Zimmerman, 1990), and with a 'task completion' purpose for learning (Lichtinger and Kaplan, 2015), and in others more meaningfully. Claire's level of SRL competence was rated at the 'emulation' level (Schunk and Zimmerman, 2007; Usher and Schunk, 2018; White and DiBenedetto, 2018). Her goal orientation profile was mixed, and her 'performance avoidance' orientation, which surfaced alongside low self-efficacy when confronted by challenging academic tasks, appeared to counteract many of the benefits of the 'mastery approach' orientation she adopted when learning was more manageable or enjoyable.

However, the cognitive and metacognitive awareness indicated by some of her work samples were not significantly underdeveloped when compared to more effective self-regulators. Although she did not typically demonstrate sound understanding in relation to subject-specific criteria, an important gap between her and more highly self-regulated students, Claire's strategy use tended to involve many SMART cognitive processes (Winne, 2018), be appropriate for the task, and demonstrate evidence of elaboration (Donker *et al*, 2014). She also created desirable difficulties, such as spacing study sessions, generating her own notes (Bjork and Bjork, 2011), dual code presentations and focusing on relevant, versus irrelevant but interesting, information (McCabe, 2011). Nonetheless, the amount of information contained in two of the four work samples she submitted was sparse and unlikely to serve as an adequate gauge for accurate monitoring or self-evaluation and, although the quality of Claire's strategies

varied, her overall ‘holistic’ information processing levels were measured lower than more highly self-regulated students’ levels.

Surprisingly given its recent emergence into the field of self-regulated learning (Muis and Singh, 2018), epistemic awareness most significantly distinguished the quality of Claire’s work samples and those submitted by more effective self-regulators. Claire’s epistemic awareness was rated under 2 on a scale of 1-4 for two of the three work samples for which epistemic awareness could be measured. While her strategy format was often conducive to deep conceptual understanding and she implemented potentially deep strategies for complex learning tasks (Pieschl *et al*, 2014), her implementation of these strategies tended to be superficial. Furthermore, she did not seek multiple standards for knowing (Muis and Singh, 2018), either when learning content or when reflecting upon her own performance, nor did she demonstrate the reflexive thinking (King and Kitchener, 2004) that characterised the quality of the work submitted by more highly self-regulated students.

The low levels of epistemic awareness Claire demonstrated may have contributed to her limited reflection on her own learning as well as to the inaccurate task calibration indicated by a comparison of her biome case study four-column chart to the example she had been provided. Limited epistemic awareness could also have contributed to Claire not taking advantage of a supportive environment by seeking formative assessment from peers or teachers, as other students did. If one is unaware of a need for validation, justification, and sourcing (Muis and Singh, 2018), or is not inclined to ask, “What kinds of reasoning and evidence support this?” (King and Kitchener, 2004), why would one reflect on one’s own learning or seek feedback regarding one’s own performance? Or, as suggested by Patrick and Middleton (2002), if one views knowledge as simple and certain, why integrate different ideas and sources, look for exceptions, or question whether evidence from different sources conflicts? The

importance of epistemic awareness to effective self-regulation is discussed in more detail below.

5.2 Epistemic awareness: Vital to SRL

I identified two possible pathways for the influence of epistemic awareness on self-regulated learning in this investigation. First, epistemic awareness appeared to be linked to reflection (Schön, 1995; Procee, 2006; Molander, 2008; Kinsella, 2007) which, perhaps, should have been unsurprising as 'the process of critically reflecting on evidence is a fundamental feature of empirical epistemology' (Avis and Freshwater, 2006, p. 216). Further supporting a link between epistemic awareness and reflection, Winne (1997) suggests that, through cognitive reflection, 'prior knowledge and beliefs serve as a student's initial theory, couched in a historically developed, personal paradigm about what learning is, methods for learning and how this view of learning can be updated by new information' (p. 398).

In the current investigation, the reflexivity of students' thinking as described by King and Kitchener (2004), whether they considered multiple standards for knowing (Muis and Singh, 2018), and whether they demonstrated an exploratory orientation (Flum and Kaplan, 2006), all appeared to be related to whether or not participants were inclined to reflect on their learning, as well as to the quality of reflection that emerged from the data. In fact, the IB's Reflection skills (see Table 1) are highly congruent with these aspects of epistemic awareness. To illustrate this, I compare the influence of reflection on the SRL of two participants (Eliza, who demonstrated high levels of epistemic awareness and was inclined to reflect, and Hannah, who demonstrated low levels of epistemic awareness and was not inclined to reflect) and relate this to aspects of epistemic awareness.

Eliza, upon experiencing difficulties as a new student in Grade 9 due to limited English proficiency, considered how she could overcome this obstacle while her language was still developing. While not privy to knowledge about cognitive load (Kirschner *et al*, 2006), she recognised that she could not understand what she was being taught when she tried to take notes while instruction was ongoing. Demonstrating an exploratory orientation from the outset, she engaged in trial and error, exploring different strategies, monitoring their effectiveness, and reflecting about which worked best for her and, importantly, *why* they worked best, using evidence of her learning to validate her judgements.

She ultimately decided that she learned best when she previewed content, taking notes at home prior to her teacher's introduction of new topics, because this approach enabled her to focus on listening and understanding when in class. Once she had identified the benefits of this approach, she spent several years refining it, ultimately settling on concisely consolidating notes in different formats for different subjects, using colours and diagrams to replace extended sentences and paragraphs. She had a clear rationale for each of these decisions, based on the reflection she engaged in as she explored different ways of working.

Hannah, on the other hand, demonstrated more limited reflection. Like Eliza, she arrived at the school in Grade 9 and struggled. However, rather than reflecting on her strengths and weaknesses, exploring solutions, monitoring their effectiveness, and reflecting upon what worked best for her, Hannah frequently ended up in detention for not meeting deadlines. Her learning strategies, when she used them, were ineffective and, despite the fact that she recognised that they didn't help her, she stuck with them.

Ultimately, Hannah was diagnosed with a learning difficulty and started attending support lessons, where she developed a range of strategies for learning content, managing time, and demonstrating more effective task-specific processes. Finding these helpful, Hannah adopted them as an off-the-shelf 'package,' rather than

reflecting on how she could adapt them to better suit particular tasks (Pieschl *et al*, 2014) or adjusting them to suit her own learning preferences and achieve her own goals. There was little indication in the data that Hannah reflected on *why*, as opposed to *whether*, she found particular strategies helpful, other than the fact that they involved less memorising than her previous strategies had done. However, as her DP examinations approached, Hannah reverted to memorisation, for example attempting to memorise a large volume of information related to how to use her calculator to solve different kinds of problems.

The other pathway by which epistemic awareness seemed to have influenced participants' self-regulation was related to the quality of the strategies they implemented, as indicated by the work samples they submitted. The highest quality strategies reflected epistemic awareness that was superior to that reflected by poorer quality strategies. A detailed comparison of the epistemic awareness demonstrated by a high- and a low-quality work sample illustrates this point.

Ally submitted a high quality highlighted and annotated newspaper article she had read to prepare for the case study portion of her geography examination (p. 129). The topic under consideration was 'famine.' Demonstrating an interest in integrating differing perspectives and sources and in questioning whether evidence from those sources aligned or conflicted (Patrick and Middleton, 2002), she had read articles from a range of newspapers describing a range of famines. Furthermore, she had printed the article she submitted in a reduced scale, creating a wide margin on one side for annotations which she had grouped under the categories she would need to elaborate in her case study: causes, consequences, and solutions.

Under each category she had written several points, each of which could generate a different argument. For example, under 'causes' she had written 'armed conflict,' 'low harvest,' and 'soaring food prices' in bullet points. When annotating solutions, she had evaluated those that were more and less successful. Moreover, Ally

had highlighted supporting quotations, indicating an emphasis on justifying her conclusions with evidence (Muis and Singh, 2018). Reading multiple articles on a range of famines indicated awareness of the uncertainty, ambiguity, and incoherence of complex knowledge (Flum and Kaplan, 2006). Ally's highlighted, annotated newspaper article was a deep strategy, aiming for rigorous content knowledge, conceptual understanding, and sophisticated task-appropriate skills (Muis and Singh, 2018), appropriate for the complex task (Pieschl *et al*, 2014) of preparing a case study for an open-ended topic such as 'famine.'

Claire, on the other hand, submitted a low quality four-column chart of a biome to prepare for the case study portion of her Environmental Systems and Societies (ESS) examination (see p. 115). Her teacher had prepared a detailed model of a case study to help ESS students understand the expectations, yet Claire's case study looked nothing like the model. On the one hand, she had written her notes in a four-column format with task-specific headings that created potential for this strategy to facilitate conceptual understanding. However, rather than creating categories that would facilitate analysis, as Ally had, she created categories that promoted the acquisition of rote content knowledge: location, example, climate, production, and biodiversity. There was no emphasis on providing reasoning, evidence, or argumentation (King and Kitchener, 2004) and, because her four-column chart only listed facts about the Sahara Desert, there was no opportunity for comparison and no evidence of an awareness of uncertainty, ambiguity, or incoherence of knowledge (Flum and Kaplan, 2006). She did not seek multiple standards for knowing (Muis and Singh, 2018), and the information she included was sparse. Overall, Claire's biome case study notes did not reflect awareness that a complex task, such as a case study, required deeper strategy use.

Ally's advanced epistemic awareness and Claire's limited epistemic awareness influenced the quality of their strategies. However, given Samantha and Chloe's higher

levels of epistemic awareness, it is apparent that limited epistemic awareness is not an inevitable ‘symptom’ of a learning difficulty. Furthermore, one of the DP standards for teaching and learning involves engaging students as thinkers and inquirers and addressing ‘human commonality, diversity and multiple perspectives’ (IB, 2014b, p. 25), indicating that, from the IB’s perspective, epistemic awareness is ‘teachable.’ Indeed, Wright’s (2015) life history research illustrates that one of the enduring and positive impacts the DP has on its graduates is the development of their skills of critical analysis and the ‘broadly critical orientation to the world’ (p. 49) it instils.

Given the importance of epistemic awareness to the effectiveness of students’ self-regulated learning, what are the implications of this for teachers within the IB Diploma Programme? I now turn to a discussion of the how a student-centred, process-focused approach, alongside explicit instruction of particular ATL skills, could potentially enhance students’ epistemic awareness.

5.2.1 How student-centred, process-focused instruction could potentially facilitate epistemic awareness

Muis and Singh (2018) argue that epistemic awareness is best developed within a social constructivist classroom environment, because when people are confronted with repeated exposure to information that conflicts with their existing beliefs as well as to complex, contradictory information about a particular topic, epistemic change can, over time, occur. IB teachers are encouraged to actively engage students in discussions and other activities that illuminate, draw upon, and value multiple perspectives and challenge students’ thinking (IB, 2014b; IB, 2009). When discussing their perceptions of ‘good teaching,’ all participants valued class discussions that provided them with opportunities

to share their own and hear others' points of view. They preferred to have opportunities to challenge themselves to think, and to hear what their peers thought, over more didactic teaching, even if it meant mistakes were inevitable. In fact, the teaching practice that most exemplified good teaching for participants in this investigation was this sort of discussion. They relished the chance to be asked, '*What do you guys think?*'

Collaborative learning is another SRL-promoting practice (Li, 2012; Black *et al*, 2006; Patrick and Middleton, 2002) with potential to develop students' epistemic awareness. Because the collaborative element of constructivist environments allows the 'externalisation of epistemic thinking' (Muis and Singh, 2018, p. 451), those with lower levels of epistemic awareness have ready access to more highly developed students' 'powers of mind and ways of thinking' (IB, 2014a, p. 15). Moreover, involving students in small group discussions gives them opportunities to hear each other's perspectives and to share their own. Given that epistemological development can be extremely difficult, even traumatic (Kember, 2001), collaborative learning activities, by promoting social interdependence and positively influencing students' perceptions of the supportiveness of the environment (Johnson and Johnson, 2009), can potentially mitigate any 'trauma' that might otherwise be associated with epistemological development. In this investigation, although some participants referred to challenges associated with collaborative learning, collaboration was so valued overall that grade-wide and subject-specific social media groups had been created for Grades 11 and 12.

Formative assessment, entailing 'considerations of instructional design, curriculum, pedagogy... and epistemology' (Black and Wiliam, 2009, p. 8) also has potential to support epistemological development. For example, participants suggested that formative assessment enhanced their ability to think critically, particularly when they received feedback on annotations, essay plans, and essays. The most highly self-regulated students were also inclined to use criteria to formatively self-evaluate their own performance, or to swap papers with a peer, providing them with evidence

supporting their own judgements regarding the quality of their work. Furthermore, focus group participants discussed how important it was for them to develop their understanding of issues such as the validity, reliability, and bias of their sources, which can be done through formative assessment.

Because DP assessments are ‘designed to reward evidence of independent student thinking leading to considered individual responses’ (IB, 2009, p. 37), process-focused instruction also emerged from the data as useful for helping participants engage more critically with ideas. For example, being taught acronyms such as PEEL, for example, helped Samantha understand that each paragraph in her geography essays should include a point, followed by explanation, then evidence, then a link back to her argument. Being encouraged to colour-code each of these features in her first essay reiterated this. This supports Muis and Singh’s (2018) suggestion that modeling and scaffolding can facilitate the development of epistemic strategies and knowledge.

Although many DP teachers feel they do not have time to engage in student-centred, process-focused instruction due to the amount of content in DP syllabi (Li, 2012; Hallinger *et al*, 2011; Forrest, 2018), DP assessments emphasise analysis, evaluation, problem-solving, and the presentation of arguments as well as knowledge and understanding of content and concepts (IB, 2016; IB, 2009). During her interview, Ally, one of the most highly self-regulated participants in this investigation, explained that Diploma Programme examinations require students to be able to think for themselves, rather than memorise what their teachers think. She and the other highly self-regulated participants had submitted work samples that emphasised reasoning, evidence, justification and critical evaluation of sourcing, all of which are aspects of epistemic awareness.

Nonetheless, the transition from the MYP to the DP was not easy, even for high-achievers. Five of six participants in the high-achieving quintain reported that their Grade 11 examinations and assessed coursework had come as a shock because of the

unexpected level of thinking and analysis involved. Emphasising content through a didactic teaching approach, rather than providing students opportunities to think and to grapple with challenging material, may constrain the development of the epistemic awareness that distinguished the highest and lowest self-regulators in this investigation.

5.2.2 How explicit instruction of ATL skills could potentially facilitate epistemic awareness

The most relevant ATL skills to the development of epistemic awareness appear to be Research, Reflection, and Thinking skills. Research skills in the IB, for example, include selecting and evaluating data sources, seeking a range of sources from multiple perspectives, and comparing, contrasting and seeking connections amongst sources (IB, 2014a), all of which are related to epistemic awareness (Muis and Singh, 2018; King and Kitchener, 2004). Participants in both focus groups agreed that being taught Research skills in the DP is extremely important, and ‘high-achieving’ focus group participants suggested that finding valid, reliable information is crucial to be able to produce the quality of work the IB expects at the highest levels.

Reflection in the IB (IB, 2014a) involves developing new techniques and strategies for effective learning and demonstrating flexibility in the selection and use of learning strategies, which are relevant to the development of an exploratory orientation (Flum and Kaplan, 2006). Reflection in the IB also refers to trying new ATL skills and evaluating their effectiveness, which inevitably requires students to use reasoning and evidence to support judgements (King and Kitchener, 2004). Participants in both focus groups believed it is important for teachers to teach them how to reflect, and those in the high-achieving focus group suggested that reflection in the DP had enhanced every other aspect of their thinking skills, as well as their overall learning.

Thinking skills in the IB (IB, 2014a) include recognising unstated assumptions and bias and evaluating evidence and arguments, which are also relevant to epistemic awareness (Muis and Singh, 2018; King and Kitchener, 2004). Participants in the high-achieving focus group preferred being asked what they thought to being told what to think. As embedding SRL processes and strategies within content area teaching can help students learn to value and apply these processes and strategies in context (Butler and Schnellert, 2015; Schunk and Ertmer, 2000; Hattie *et al*, 1996; Harris and Graham, 1999), embedding explicit instruction of Research, Reflection and Thinking skills into content area teaching may have promise for developing students' epistemic awareness.

5.3 Mastery by performance goal orientation

Research evidence frequently suggests that mastery approach goals tend to result in more effective self-regulated learning than performance goals (Usher and Schunk, 2018; Schunk and Ertmer, 2000; Lichtinger and Kaplan, 2015). In the current investigation, however, 'mastery by performance' (Sideridis, 2006, p. 13) goals, by which students aim to master assessment criteria rather than focusing on self-set standards, were more conducive to SRL. This finding supports Biggs' (2012) assertion that in a 'fully criterion-referenced system... students are "entrapped" in [a] web of consistency, optimising the likelihood that they will engage the appropriate learning activities' (p. 45). It also supports White and Di Benedetto's (2018) view of standards as 'roadmaps for student learning and performance' (p. 209). As all three theoretical perspectives of SRL underpinning this investigation agree that accurate task perceptions are required for effective self-regulated learning, this finding further supports their compatibility.

To illustrate the superiority of a mastery by performance orientation to a mastery approach orientation in this investigation, I now review Hannah's case. Hannah was the only participant who demonstrated a primarily mastery approach orientation, albeit a weak one, yet she was one of the least self-regulated participants in this study. Her mastery approach orientation motivated her to use a range of strategies to learn content and skills, and she metacognitively monitored her learning, as well, for example by checking her answers and correcting her errors on daily maths quizzes and monitoring her confidence when highlighting and annotating. According to her most recent school report teacher comments, she worked hard and asked for help when needed in the majority of her subjects.

However, Hannah did not engage with assessment criteria to self-evaluate her own performance, nor did she seek criteria-specific formative assessment from others. Although she felt confident in her approach and believed she was learning, her maths teacher's school report comments indicated he was not convinced she was giving maths her best efforts, despite the mastery approach orientation that emerged from the data related to this subject. It is possible that Hannah and her teacher had different interpretations of what successful learning entailed (Butler and Schnellert, 2015), and because Hannah did not engage with the criteria in this subject, she learned what she *believed* she needed to learn, rather than what she *actually* needed to learn.

On the other hand, participants who demonstrated a 'mastery by performance' orientation reported aiming for good grades, focusing their efforts on attaining the highest assessment criteria possible, rather than on the grades themselves. The criteria thus served as a roadmap, 'demystifying' (Butler *et al*, 2013) the demands of the work they engaged in and reducing participants' chances of constructing inaccurate understandings of performance criteria. The work samples submitted by participants who demonstrated a mastery by performance goal orientation tended to be more effective and more efficient than those submitted by those who did not.

5.3.1 Who set ‘mastery by performance’ goals in this investigation?

In this investigation, all participants at the ‘self-regulation’ level of competence (Schunk and Zimmerman, 2007; Usher and Schunk, 2018; White and DiBenedetto, 2018) demonstrated a mastery by performance goal orientation. Of these four participants, two had experienced academic difficulties prior to enrolling in the DP (one had a learning difficulty and one had enrolled in the school with limited English), and the others had experienced some difficulties once enrolled in the DP. For example, although Ally had consistently been a high-achiever prior to the DP, in Grade 11 she had experienced stress and anxiety which she associated with a ‘fixed mindset’ and performance orientation. As a result, she had decided to stop focusing on the grades she was getting and, instead, focus on how she could achieve the grades she aspired to. Experiencing challenge and reflecting upon how to overcome obstacles drew each of these participants to the same solution: utilising criteria as a roadmap to higher achievement.

There were several other similarities that emerged from the data generated by participants who exhibited a mastery by performance orientation. First, they were highly self-determined. They were aware of their strengths and their weaknesses and believed they could overcome their weaknesses through their effort and the strategies they used. Thus, there was nothing ‘reactive’ about their strategy use. In fact, pervasive across data sets for each case was an emphasis on the perspective that *it has to come from the student*. By ‘it’ participants were referring to motivation and the adaptive learning and work habits they had developed in response to the demands of the curriculum and the academic challenges they experienced. Accordingly, the ‘purposes for engagement’ demonstrated by participants with a mastery by performance orientation tended to involve a balance of learning and achieving. As such, the data generated by each of their cases indicated an overall deep-achieving *modus operandi*. According to Biggs (1993), a

deep-achieving approach focuses students on the processes of learning and performance, with the aim of maximising their success.

With this in mind, these participants came across in the data as ambitious, several using this very word to describe themselves. Although ambition is not addressed in SRL literature, like the most highly self-regulated participants in this investigation, ambitious people are characterised by ‘competitive striving’ (Jones *et al*, 2017, p. 13). Ambitious people ‘search for opportunities, take initiative to seize the opportunity, and persevere’ (Jones *et al*, 2017, p. 5). Thus, they ‘rarely procrastinate or lose sight of their mission’ (p. 12). This characterisation of ambition also describes the participants in this investigation who demonstrated a mastery by performance orientation. They were highly proactive, explored strategies, monitored their learning, self-evaluated their performance against the criteria, exerted enormous levels of effort during independent learning activities and, as needed, involved anyone who could support them in maximising their potential in the IB Diploma Programme.

5.3.2 How student-centred, process-focused instruction could potentially facilitate a ‘mastery by performance’ orientation

This investigation’s findings in relation to a mastery by performance orientation bring into sharp relief the notion that although self-regulated learning is considered a valuable outcome of schooling (Wolters, 2010), it is not typically the outcome by which most students’ success is measured. Beyond school SRL contributes to a propensity for lifelong learning (Dignath and Büttner, 2008) and professional success in a rapidly changing world (Wolters, 2010), but in school SRL is a pathway to successful learning and academic achievement (Donker *et al*, 2014). This begs the question: If the goal of a student’s IB Diploma Programme education is successful learning, how do invested

stakeholders (teachers, parents, policy makers, the universities to which students aspire, the IB, students themselves) know the goal has ultimately been accomplished? Clearly, most stakeholders measure successful learning by students' attainment, as evidenced by their grades. Accordingly, the most effective regulators in this investigation were criteria-driven, purposely aiming for attaining the highest criteria they could, rather than aspiring to master content and skills using self-set criteria.

According to Dweck (2015), a 'growth mindset,' often associated with a mastery approach goal orientation, has become the correct mindset, the thing to have, which has set in motion a tendency to celebrate 'effort,' even in the face of achievement gaps. She argues that the actual intention of the growth mindset was to tell students the truth about their achievement and help them do something about it. When teachers utilise transparent assessment criteria in this endeavour, student learning benefits (Biggs, 2012; White and DiBenedetto, 2018), and the results of this investigation indicate that teaching students to do the same has promise for the enhancement of students' SRL.

A student-centred, process-focused approach has great potential to facilitate a mastery by performance goal orientation. For example, when Annabelle was learning to analyse poetry, her English teacher taught her to read through the poem once to get the gist, and then do multiple 'read-throughs' to identify poetic devices. Coaching her to utilise assessment criteria throughout the writing process, as an additional step in this process-focused approach, would not take much instructional time and would help her better understand how to transform her annotations into an effective commentary. Being coached by teachers to utilise criteria could help students learn to value doing so as part of an effective process.

Because it enhances students' understanding of assessment criteria (Black and Wiliam, 2010; Black et al, 2004; Dann, 2014; Nicol and MacFarlane-Dick, 2006; White and DiBenedetto, 2018), formative assessment, too, has great potential for facilitating a mastery by performance goal orientation. Criteria-driven teacher-, peer-, and self-

assessment provided the highest-regulated participants in this investigation with a clearer understanding of how to achieve the higher levels of attainment to which they aspired. Formative assessment was also considered a ‘good’ teaching approach because, by ensuring participants fully understood their current levels of achievement, as well as how to improve, it had a positive impact on their well-being.

Collaborative learning activities also have the potential to facilitate a mastery by performance orientation because they encourage students to articulate their metacognitive (Black *et al*, 2006) and cognitive processes. Accordingly, teachers can engage students in co-regulation, for example in interactive discussions using ‘procedural facilitators’ (Butler, 2002a, p. 90) to guide students to utilise criteria during self- and peer- assessment. Thus, poor self-regulators working in groups with more successful self-regulators would not only have opportunities to learn that successful self-regulators self-evaluate their own performance against assessment criteria, they would begin to understand procedures for and benefits of doing so. Students could also co-construct methods for utilising assessment criteria to boost learning and performance through opportunities for shared regulation.

5.3.3 How explicit instruction of ATL skills could potentially facilitate a mastery by performance goal orientation

The IB (2016) suggests that one of the purposes of ATL in the Diploma Programme is to support students’ ability to manage their own learning. Because the ATL skills of ‘Reflection’ includes evaluating the effectiveness of one’s strategies and considering how one can become a more effective learner (IB, 2014a), it has particular relevance for the development of a mastery by performance orientation. Participants in this investigation highly valued the skill of reflection and agreed that teachers should

teach it explicitly. To do so in a way that facilitates a mastery by performance orientation, teachers might utilise prompts that facilitate students' reflection on the extent to which they utilised assessment criteria throughout their process, thus drawing their attention to the benefits of doing so. Again, such an instructional approach need not take time away from teaching content.

Furthermore, the ATL Affective skills, including analysing and attributing causes for failure and practising dealing with disappointment and unmet expectations (IB, 2014a), also appear relevant to the development of a mastery by performance orientation. Other Affective skills include managing self-talk, failing well, and bouncing back from failure (IB, 2014a). Ally's shift in mindset reflected a development in her Affective skills. *'There was a point where I realised that I should stop focusing on the grades I'm getting right now and focus on how I'm going to achieve the grades I want.'* Helping students consider assessment criteria as part of their self-talk or helping them bounce back from failure by drawing their attention to assessment criteria as a 'roadmap' for improved performance has great potential to facilitate a mastery by performance orientation.

5.4 The development of SRL within IB Diploma Programme participants with learning difficulties

Mason and Reid (2018) suggest that, 'even in the best possible environment, individuals with special needs will have some difficulties with self-regulation' (p. 482). However, Butler and Schnellert (2015) argue that 'the needs of students with LD can be met, in large measure, if supports to SRL are built into classrooms so that all learners can experience success and learn how to take deliberate, strategic control over learning' (p. 130). The findings of this investigation support both positions. Content teaching

remained largely 'traditional,' but most DP teachers had adopted a more process-focused approach with regard to performance tasks and assessed coursework, frequently engaged in formative assessment, and made strategy recommendations. Although less proactive participants with LD who did not take advantage of this did require support lessons outside the regular classroom, proactive participants did not require more support than the student-centred elements of instruction offered by their teachers.

Zimmerman (2002) argues, 'if a student fails to understand some aspect of a lesson in class, *he* or *she* must possess the self-awareness and strategic knowledge to take corrective action' (p. 65). Through appropriate levels of proactive help-seeking (Azvedo *et al*, 2008) and other mechanisms of co-regulation such as strategy guidance, formative assessment, scaffolding and fading (Perry *et al*, 2018), the two most highly-regulated participants with learning difficulties compensated for their diagnosed processing deficits and became increasingly autonomous in their learning. These participants adapted to varying contexts, proactively seeking guidance and support where it might not have otherwise been forthcoming, particularly flourishing in student-centred, process-focused classrooms. Samantha was rated at the 'self-regulated' level of SRL competence, while Chloe was rated between the 'self-control' and 'self-regulated' levels.

Samantha is a particularly encouraging example because, despite multiple significant processing difficulties, she was amongst the four highest self-regulators in this investigation. Samantha worked on the basis that she could always do better, believing she could be successful if *she* took a particular approach that included working with her teachers as allies in this endeavour. Commencing the DP with a propensity to exert effort and work strategically, she developed her own strategies through trial and error, asked her teachers to suggest strategies and tried those they suggested, and found many that supported her learning. She regularly submitted work for feedback and took advantage of any scaffolding teachers offered. Although pursuing DP course certificates

instead of the full Diploma because of the extra time she needed to complete coursework and assessments, she set ambitious goals in each subject. In her school report, her teachers expressed confidence that Samantha would experience great success in her Diploma Programme examinations because of the levels of ownership over her learning she had taken during the two-year programme.

However, not all participants with learning difficulties were equally successful. Neither of the least successful self-regulators in this investigation were consistent in their effort exertion or strategy use, and although both were aware of the support offered by their teachers, neither took advantage of supportive elements of their DP context. Instead, Claire tended to blame her ability and her teachers for her failures, while Hannah explained that she lacked the necessary motivation.

Nonetheless, as indicated by across-measure intra-rater reliability checking, the gap between the cognitive and metacognitive awareness of the lowest self-regulators and the highest self-regulators was not quite as wide as with other aspects of their self-regulation. Because both submitted and described only strategies they had been taught and had ‘brought’ few other strategies to their learning, this finding appears to reflect cognitive and metacognitive ‘training’ they had received. This supports Bjork *et al*’s (2013) assertion that training, along with practice and experience, has potential to mitigate individual differences in ability. It also suggests that aspects of cognitive and metacognitive aspects of SRL can, indeed, be taught to students with LD and raises the possibility that epistemic awareness can also be taught. Although there is a lack of literature pertaining to how epistemic awareness relates to learning difficulties, research evidence suggests that limitations in cognitive and metacognitive awareness often accompany learning difficulties (Hübner et al, 2010; Harris and Graham, 1999; Watson et al, 2016; Ruban et al, 2003; Miranda *et al*, 1997). Thus, this is an encouraging finding.

5.4.1 Developing the self-regulation of students with learning difficulties through a ‘self-regulation empowerment’ support programme

It has been established in the literature that learning support programmes, particularly programmes that emphasise remedial skills (Reis et al, 2000) or offer dependence-provoking support (Field et al, 2003), can inhibit students in taking ownership of their own learning. Conversely, programmes that draw on social cognitive theory to empower underperforming students to more effectively regulate their own learning can be more successful (Cleary and Platten, 2013; Cleary and Zimmerman, 2004). However, the most successful participants with learning difficulties did not take part in a support programme while enrolled in the Diploma Programme.

In this investigation, the two higher self-regulators with learning difficulties had been diagnosed young and had received support earlier in their schooling, but no longer required support in the DP. The lower self-regulators, on the other hand, had not been diagnosed nor received support until high school, after experiencing a sustained period of academic difficulties and failure. At the time of this investigation, each continued to demonstrate limited self-regulatory profiles, despite the support they received (Butler *et al*, 2011). With this in mind, Usher and Schunk (2018) argue that ‘self-regulatory habits that are developed early become the patterns that guide people throughout their lives’ (p. 33). As mentioned previously, the highest self-regulators entered the DP as higher self-regulators, and the lower self-regulators entered the DP as lower self-regulators. It is possible that younger students may be more amenable to interventions aimed at improving their SRL than older students because they have not yet developed maladaptive habits (Donker *et al*, 2014).

In the current investigation, what participants ‘brought’ to their learning, including their histories and personal attributes, seemed to serve as antecedents to initial self-regulatory processes such as task analysis or drawing upon self-efficacy beliefs.

Lower-regulated participants with LD, who had arrived at the school with poor work habits, few strategies and undiagnosed learning difficulties, made assumptions about themselves as learners that initially caused them to avoid academic tasks altogether. Through involvement in the school's support programme, although they were still less inclined than to take advantage of a supportive context and regulate their learning than were higher regulated participants with LD, each had developed a repertoire of strategies that they used with varying degrees of effectiveness.

Although this is encouraging, the minimal extent to which the lowest self-regulators explored strategies that worked for them, reflected upon their learning, and self-evaluated their performance in this investigation cannot be ignored. As argued by Butler and Schnellert (2015), some students with learning difficulties will use taught strategies when prompted to do so but may not independently select and implement strategies to meaningfully achieve important task-related goals. From a social cognitive perspective, instruction emphasising the 'performance' phase of self-regulated learning, without an equal emphasis on the 'reflection' and 'forethought' phases, may not help students develop into self-regulated learners (Cleary and Platten, 2013; Cleary and Zimmerman, 2004).

From a situated perspective, the support programme in which the two lower-regulated participants with LD were involved emphasised 'teaching' them strategies rather than 'co-constructing' strategies with them (Butler, 2002a). The lowest-regulated participants 'reactively' (Zimmerman, 1990) implemented strategies exactly as they perceived the strategies had been taught, with minimal attention to task criteria or reflection on the success of their strategy use in relation to criteria.

A careful review of the literature revealed no studies related to the epistemic awareness of students with learning difficulties, and no studies investigating support programmes designed to empower self-regulated learning from an information processing perspective. However, this investigation demonstrated that an exploratory

orientation (Flum and Kaplan, 2006), multiple standards for knowing (Muis and Singh, 2018), a justification of claims with reasoning and evidence (King and Kitchener, 2004), an understanding that simple tasks may require shallow strategies while more complex tasks may require deeper strategies (Pieschl *et al*, 2014), and awareness of the ambiguity, incoherence and relativity of knowledge (Flum and Kaplan, 2006) distinguished the quality of participants' strategies more significantly than did their cognitive or metacognitive awareness. Muis (2007) argues that interventions aimed at enhancing epistemic awareness can work, so this could be a worthy aim for SRL-promoting support programmes. I now turn to a discussion of the potential of student-centred, process-focused teaching to enhance the SRL of participants with learning difficulties.

5.4.2 How student-centred, process-focused instruction could potentially facilitate SRL in students with learning difficulties

For secondary students with learning difficulties, experiencing student-centred, process-focused instruction in classrooms with non-LD peers ultimately results in the best outcomes (Perry, 2004; Cortiella and Horowitz, 2014; Butler and Schnellert, 2015). It is these practices that are considered 'SRL-promoting,' were considered 'good teaching' by participants with learning difficulties in this investigation, and are encouraged by the IB. Accordingly, a range of DP standards for teaching and learning (IB, 2014b) may have the potential to facilitate the self-regulated learning of students with LD. These include supporting students to become actively responsible for taking control of their own learning, using a range and variety of instructional methods, differentiating instruction to meet students' learning needs, fostering a stimulating

learning environment based on understanding and respect, and encouraging students to demonstrate their learning in a variety of different ways (p. 25).

Furthermore, while in traditional classrooms ‘knowing’ and ‘doing’ are typically considered separate processes (Brown *et al*, 1989), in this investigation students with learning difficulties viewed good teaching as combining knowing with doing. Their teachers also contributed to their self-efficacy for SRL by providing models and scaffolding instruction, thus helping them develop and master the skills (Usher and Schunk, 2018) strategies, and attitudes involved in SRL. ‘Reactive’ participants, while less likely to seek support or guidance, benefitted from these when offered, developing strategies such as highlighting and annotating, or completing past papers, with their teachers’ encouragement. Consistent with Butler *et al*’s (2011) characterisation of SRL as a matter of work habits and mindset, developed over time, activity and location, the two least self-regulated participants, who had enrolled in the school lacking an effective approach, believed DP teachers should teach strategies from the start of the programme to curb the development of bad habits.

Formative assessment also facilitated the development of SRL in participants with learning difficulties. Samantha, in particular, gradually internalised performance standards by submitting drafts for feedback, which enhanced her performance and skills and increased her self-efficacy. Claire, on the other hand, preferred not to submit work for formative assessment if she did not think her work was ‘perfect.’ However, she did appreciate opportunities for informal formative assessment through process-focused dialogue. This supports Black and Wiliam’s (2010) assertion that teachers should endeavour to engage in interactive dialogue with students, rather than a top-down telling. This investigation demonstrated that when teachers bear in mind that students’ assessment histories, motivation, and perceptions influence how they receive and apply feedback (Wiliam, 2011), formative assessment can promote a ‘culture of success’ (Black and Wiliam, 2010, p. 83) for students with learning difficulties. I now turn to a

discussion of how explicit instruction of ATL skills could potentially have enhanced Claire's SRL.

5.4.3 How explicit instruction of ATL could potentially facilitate SRL in students with learning difficulties

The ATL skills most relevant to epistemic awareness and facilitating a mastery by performance goal orientation (Affective, Thinking, Research and Reflection skills) have been briefly described above. In addition to these, other ATL skills, particularly Self-management and Collaboration skills (IB, 2014a), could be particularly relevant to the development of SRL in students with learning difficulties. For example, the 'Self-management' skills most relevant to Claire's poor SRL include planning assignments and meeting deadlines, setting realistic and challenging goals, planning strategies, and taking action to achieve goals. As indicated by her school report teacher comments, her teachers were well aware of her difficulties and encouraged her to improve, but they did not explicitly teach her how to do so. Focus group data suggested that these ATL skills were more expected than taught in this context.

Furthermore, Claire's temperament and lack of self-determination contributed to a passive approach that constrained the development of her SRL and, from the tone of some of their report comments, seemed to frustrate some of her teachers. Explicitly teaching Claire Collaboration skills, such as taking responsibility for one's own actions, giving and receiving meaningful feedback, and advocating for one's own rights and needs (IB, 2014a), may have helped her transform her passive approach into a more proactive one. Despite this, focus group data indicated that these skills, too, were more expected than taught. Moreover, opportunities to collaborate in the DP were rare unless collaboration was an element of assessed coursework.

5.5 Conclusion

I began Chapter 5 by discussing the utility of integrating theoretical perspectives to preserve the complexity of SRL. I then discussed three themes, each underpinned by a different theoretical perspective, that emerged from the data in relation to the research questions posed. These included the vital role epistemic awareness played in self-regulated learning, the positive impact of a ‘mastery by performance’ goal orientation on self-regulated learning, and the potential for teaching to enhance the SRL of students with learning difficulties, thus increasing the accessibility of the Diploma Programme for these students. In discussing these themes, the potential for student-centred, process-focused instruction and explicit instruction of ATL skills to enhance the development of SRL was explored. In Chapter 6, I conclude this report by revisiting issues of reflexivity, briefly summarising my approach and key findings, and discussing practical applications, particular strengths and limitations of this investigation, and recommendations for future research.

Chapter 6: Conclusion

In this chapter, I first discuss issues of reflexivity before summarising my approach, findings, practical applications, and the limitations and strengths of this investigation. I conclude by making some recommendations for future research.

6.1 Reflexivity and my position as an insider researcher

The context of this investigation was a small, non-selective, international all-girls IB school that was grappling with balancing the student-centred pedagogical approach the IB expects of IB schools with the pressures associated with the delivery of the Diploma Programme (Hallinger et al, 2011; Shaunessy and Suldo, 2010; Taylor and Porath, 2006). The rigorous academic curriculum, high stakes external examinations, and expectation of entrance to top-tier universities for DP students, combined with perceptions regarding the importance of ‘delivering’ content, contributed to a degree of reluctance to implement a more student-centred approach to content instruction and explicitly teach ATL skills (Forrest, 2017; Forrest, 2018).

As the school’s Director of Specialist Programmes, I had strongly bought into the IB’s (IB 2016; IB 2014b) view that student-centred teaching and explicit instruction of ATL skills (Communication, Collaboration, Reflection, Self-management, Research, Thinking, Affective, and Transfer skills) have great potential to support students’ capacity to take ownership over their own learning. I had designed and led CPD sessions on Collaborative Learning, Cognitive Apprenticeship, Teaching for SRL, Structured Inquiry, Assessment for Learning, and Problem-Based Learning with this view in mind. However, the ATL CPD programme had not impacted teaching and learning in the Diploma Programme to the extent I had hoped it would. While adopting a more process-

focused approach in relation to performance tasks, most teachers were still inclined to adopt a generally ‘teacher-focused’ approach in relation to teaching content (Forrest, 2017; Forrest, 2018). Furthermore, some of the DP students I worked with in the LRC programme continued to struggle with low levels of SRL, and not all high-achievers in the EP demonstrated the high levels of SRL expected by their teachers.

With these issues in mind, I designed this investigation to help me understand how the SRL of DP students with learning difficulties and high-achievers develops in a context in which teachers are learning to adopt a more student-focused approach. This included attempting to find out if the strategies implemented by students with LD and high-achievers differed, because by accounting for any differences I hoped to be better positioned to support underperforming students in each of the specialist programmes for which I was responsible. This investigation was also designed to find out what sort of teaching participants considered ‘good teaching’ and the extent to which they considered explicit instruction of ATL skills important. I hoped that by understanding these perspectives, I could improve the ATL CPD programme, particularly its potential to enhance the development of SRL-promoting teaching and learning.

According to Stake (1995), there are multiple perspectives that can be associated with any case and no way ‘to establish, beyond contention, the best view’ (p. 108). As such, the credence of this investigation relied upon a combination of comprehensiveness, accuracy, and reflexivity. Only by continually asking ‘Do [I] have it right?’ (Stake, 1995, p. 107) and by explicitly acknowledging 1) my strong commitment to the programmes underpinning this investigation and 2) my firm belief in a relationship between student-teaching, explicit instruction of ATL skills, and SRL could I mitigate the impact of tacit beliefs and values on my findings and genuinely learn from his investigation.

I attempted to manage the relationship between me, as an ‘insider’ researcher invested in the outcomes of this investigation, and my research by taking multiple steps to increase the trustworthiness of my findings. Triangulation of data, intra-rater reliability checking within and across measures, comparing contrasting cases, engaging in multiple passes of the data, providing detailed description of methods, and including rich descriptions emphasising participants’ own words were just a few of the ways I maintained a reflexive and critical stance.

6.2 Approach

The context of this investigation was a school in which DP teachers were learning to adopt a more student-centred approach and explicitly teach ATL skills. An integrated theoretical lens, with a situated model of SRL serving as the ‘umbrella’ theoretical perspective to which social cognitive and information processing theories contributed valuable insights, was utilised to comprehensively and naturalistically understand how the SRL of participants evolved within the two-year IB Diploma Programme.

Research Questions 1-3 were addressed in Phase 1 through a qualitative multiple case study design involving two distinct quintains: high-achieving IBDP students and IBDP students with learning difficulties. The cases were four IBDP students with diagnosed learning difficulties (two in Grade 11 and two in Grade 12) and six high-achieving IBDP students (three in Grade 11 and three in Grade 12). Methods included collecting samples of participants’ independent work that reflected their approaches to learning in the IBDP; accompanying cued/prompted written reflections; semi-structured interviews utilising a combination of stimulated recall and open-ended questions; and

four years of school report teacher comments to mitigate limitations of self-report data and illuminate the development of students' SRL over time.

The second phase addressed Research Question 4. This phase involved two focus groups, one of three IBDP students with learning difficulties and the other of three high-achieving IBDP students. These were guided by open-ended questions aimed at exploring the extent to which participants believed it was important for their teachers to teach them ATL skills. Some students participated in the multiple case study phase but not the focus group phase, while others participated in the focus group phase but not the multiple case study phase.

6.3 Findings

Overarching Question: In an IB Diploma Programme in which teachers are learning to be more student-centred and explicitly teach ATL skills, how does the self-regulated learning of high-achieving students and those with learning difficulties evolve?

All participants described benefitting from opportunities for discussion, formative assessment, and active engagement in learning, particularly within the context of a supportive environment that created structures and processes for their developing SRL (Butler and Schnellert, 2015). Collaboration was so highly valued that subject and grade-wide academic social media groups had been established. Where student-centred practices occurred, they appeared to have facilitated aspects of participants' SRL, particularly strategy use and process skills. In other words, these practices did appear to support a self-regulated 'approach.' Nonetheless, a heavy emphasis on didactic teaching in the DP was prevalent. Although DP teachers often cite the DP's detailed content and

rigorous examinations as reasons not to deviate from a more didactic approach (Li, 2012; Forrest, 2017), such an approach tended to result in a negative experience for participants in both quintains, leading to boredom, disengagement, and anxiety, and in some cases also reducing the sense of self-efficacy, motivation, and ownership of their own learning needed to ignite SRL.

Furthermore, although some ATL skills, particularly Thinking, Communication, Reflection and, to a lesser extent Self-management, were embedded in DP teaching and learning, explicit instruction of ATL skills was rare. ATL skills were more expected than taught, and participants articulated why more emphasis on this would benefit their approaches to learning in the DP. For participants, ‘good teaching’ involved instructional approaches that capitalised on the empirically-grounded SRL-promoting practices espoused by the IB and included explicit instruction of ATL skills.

The issue of ‘SRL value added’ for this school was thus complex. On the one hand, school report teacher comment data demonstrated that participants who entered the DP as poor self-regulators remained poor self-regulators, and those who had entered as more effective self-regulators remained effective self-regulators, indicating limited SRL value-added by the school context. However, Grade 12 participants in both quintains used a wider range of strategies than did Grade 11 participants in both quintains. Furthermore, the self-efficacy for SRL reported by every case study participant was robust, despite research evidence (Pajares and Valiante, 2002; Usher and Pajares, 2008; Caprara *et al*, 2008) suggesting that self-efficacy for SRL may decline as students progress through school. Although most participants reported a dip in confidence in their approach in the first semester of the DP, each had gradually adjusted her approach to meet new levels of challenge. All participants were confident that the approaches to learning they had developed in the DP would enable them to meet upcoming challenges.

Nevertheless, while potentially enhancing some aspects of SRL, particularly for students with LD, DP teaching overall did not seem to mitigate the varying obstacles to

SRL that students had brought with them, such as a history of coasting, perfectionism, a passive temperament or limited self-determination. Moreover, the data, particularly focus group data, illuminated the extent to which all but the highest regulated participants continued to grapple with the stress, anxiety and sense of being overwhelmed that is commonly reported by DP students (Shanessy and Suldo, 2010; Culross and Tarver, 2011; Hertberg-Davis and Callahan, 2008). In short, although DP teaching and learning SRL processes appear to have *evolved*, enabling the lowest regulated participants to ‘survive’ increasing levels of challenge presented by the DP and highest regulated participants to ‘thrive,’ SRL levels of competence were not significantly *enhanced* overall.

PHASE ONE: MULTIPLE CASE STUDY

Research Question 1: In this context, how do high-achieving IB Diploma Programme students and those with diagnosed learning difficulties develop self-regulated learning?

Hadwin (2013) argues that ‘learners regulate more skilfully or productively in some areas of their lives than others, but all learners have an array of regulatory skills and strategies to draw upon’ (p. 213). In this investigation, all participants demonstrated SRL, although the consistency, effectiveness, and ‘pluck’ of their self-regulatory processes and skills varied depending on how what they ‘brought’ to their learning interacted with the context at a given point in time. Overall, the two participants with LD who continued to receive support demonstrated the poorest levels of SRL, while all high-achieving participants were evaluated as ‘Self-regulated’ or between the ‘Self-control’ and ‘Self-regulated’ developmental levels. However, the SRL levels of the

participants with learning difficulties who did not receive academic support were comparable to those of high-achieving participants. Therefore, having a learning difficulty or being a high-achiever did not appear to account for participants' levels of SRL in this investigation.

Findings indicated that teaching influenced the development of SRL skills and strategies implemented by participants with LD in a more direct and significant way than it did for high-achieving participants, and a criteria-driven 'mastery by performance' goal orientation was evident in the most effective self-regulators' motivation. For participants in both quintains, a developmental aspect to SRL was evident. Grade 9 emerged as pivotal to many participants' approach, and all participants described improvements to their strategy use over the course of the DP. Grade 12 participants, especially, self-reported robust levels of self-efficacy for SRL and used a greater number of strategies than did participants in Grade 11.

However, four years of teachers' comments in participants' school reports (see Appendix S) demonstrated that, although participants improved their SRL-related skills and strategies during their enrolment in the DP, their overall SRL levels of competence remained relatively stable, with minor fluctuations for some participants. For example, Karen's SRL appeared to have spiked in Grade 9; Eliza and Annabelle's had briefly dipped in Grade 11; Hannah's SRL had fluctuated throughout the DP but ultimately stabilised between the 'Emulation' and 'Self-control' levels; and Chloe's SRL had fluctuated between the 'Self-control' and 'Self-regulated' levels.

Research Question 2: In this context, do the strategies that high-achieving IBDP students use to regulate their learning differ from those students with learning difficulties use? If so, how do they differ and what accounts for these differences?

Overall, there were no notable differences in the number or type of strategies participants in the two quintains implemented. Furthermore, while the overall quality of the work samples submitted by two participants with learning difficulties was lower than that of the work samples submitted by high-achievers, the quality of their work samples varied rather than being consistently low. Moreover, the quality of the work samples submitted by the other two participants with learning difficulties was comparable to that of high-achievers. Thus, having a learning difficulty or being a high-achiever did not appear to determine strategy quality.

Instead, strategy quality appeared to be directly related to the cognitive, metacognitive, and epistemic awareness that participants applied. The cognitive and metacognitive awareness of the least regulated participants was not substantially lower than that of higher-regulated participants, but the gap between their epistemic awareness levels and those of higher-regulated participants was more profound. As the lower-regulated participants with LD had submitted only work samples that reflected strategies they had been taught, it appears that instruction had positively influenced their cognitive and metacognitive awareness but not their epistemic awareness. The influence of teaching was also evident in the work samples of participants in the higher self-regulators in the learning difficulties quintain but was less evident in the data pertaining to participants in the high-achieving quintain.

Research Question 3: In this context, what teaching approaches do high-achieving IBDP students and those with learning difficulties consider to be ‘good teaching’? How do these relate to SRL-promoting teaching approaches identified in the literature and espoused by the IB?

Research evidence suggests that students expect and are able to recognise good teaching (Spooren and Mortelmans, 2006). In this investigation, participants' views regarding good teaching aligned with the SRL literature and pedagogy espoused by the IB, not with the views their teachers had previously attributed to them (specifically that DP students would resist a student-centred approach and time taken to explicitly teach ATL skills) (Forrest, 2017).

There were three teaching practices that participants considered to be 'good teaching,' all of which empirical evidence (see Butler and Schenellert, 2015) suggests are SRL-promoting practices. The first, 'teaching that afforded participants opportunities for discussion, critical thinking, and active engagement in learning,' was identified by three of four participants with LD and all high-achieving participants as a good teaching practice. The second, 'formative assessment,' was identified by all participants with LD and five of six high-achieving participants as good teaching. The last, a 'process focus,' was identified by three of four participants with LD and five of six high-achieving participants as a good teaching practice.

No participant in this study described a purely didactic approach as 'good teaching.' In fact, several participants from both quintains explicitly contrasted 'good teaching' with didactic teaching. As one of these was the lowest self-regulator in this investigation, this contradicted previous research findings suggesting that students with less sophisticated understandings of learning may prefer a more traditional approach (Bjork *et al*, 2013; Kember, 2001).

Although there were no notable differences between what participants in the two quintains considered to be good teaching, there were subtle differences in their reasoning. All participants reported learning better from student-centred, process-focused teaching, but whereas all high-achieving participants also emphasised enjoyment of this type of teaching, only one participant with learning difficulties mentioned enjoyment. Also, participants with learning difficulties largely described

process-focused instruction as making learning more manageable, while high-achieving participants were more likely to describe this approach as making learning more effective and efficient.

PHASE TWO: FOCUS GROUPS

Research Question 4: In this context, how important do high-achieving IBDP students and those with learning difficulties think it is for teachers to teach them Approaches to Learning skills?

Participants in both quintains valued ATL skills as vital to success in the IB Diploma Programme and agreed that it is important for DP teachers to explicitly teach these skills. However, although they valued Collaboration highly enough to create grade-wide academic social media groups, most participants did not feel that Collaboration can be taught. Also, some high-achievers preferred Self-management skills to be scaffolded as-needed, rather than explicitly taught. The perspective that ATL skills are important and worthy of instructional time contrasted with teachers' assumptions regarding DP students' preferences highlighted in my IFS (Forrest, 2017).

6.4 Contribution to knowledge

Practitioner knowledge and advancement of practice

The findings of this investigation illustrate that, although the DP is widely regarded as an appropriate academic programme for high-achieving students, it may also be an appropriate university preparatory programme for students with learning

difficulties. This is certainly a novel finding and good news for any non-selective school, like mine, that enrolls students with learning difficulties and encourages them to undertake the full DP to the greatest extent they can. However, as enrolment decisions are made, close attention needs to be paid to what these students bring to their learning, as well as to how that may interact with the opportunities and limitations within the teaching and learning context. Although all stakeholders should endeavour to understand the advantages and challenges presented by DP teaching and learning at a particular school and for a particular student, this may be particularly crucial when students bring with them learning difficulties and associated challenges.

Furthermore, this investigation highlights that there are relatively simple and practical steps that teachers can take to support DP students with learning difficulties in the development of their SRL. Teaching them how to use criteria to plan, develop processes and strategies and monitor and self-evaluate their own learning and performance can support them in adopting a ‘mastery by performance’ goal orientation and instil the confidence they need to take ownership of their learning. This finding informed a recent Department Chairs workshop I presented on the topic of ‘Creating SRL-Promoting Task Sheets.’ Furthermore, teaching students with LD to reflect on how they acquire and evaluate knowledge could support the development of their epistemic awareness.

However, understanding the beliefs, attitudes, values, and expectations that interact with their learning difficulties is also vitally important. As suggested by data pertaining to the most successful self-regulators in this investigation, *‘it has to come from the student.’* Although the context can certainly support the development of SRL, each student will ultimately define her own approach. These considerations need to be accounted for in DP classrooms as well as in specialist programmes if additional support is needed. A more nuanced view of the learner as a decision-maker is something I have

gained from this investigation and applied to all three of the specialist programmes for which I am responsible.

As a result of this investigation I have also learned a tremendous amount about self-regulated learning and how to promote it. My understanding of cognitive, metacognitive and epistemic awareness has greatly developed, and scrutinising the impact of these on the quality of participants' work samples has now become an invaluable aspect of my work with my students. The process of analysing the thinking underpinning strategy use has also become an important element of the CPD I provide, which now incorporates a view of cognitive, metacognitive, and epistemic awareness as 'teachable.' Moreover, a more sophisticated understanding of SRL as a developmental process encompassing four levels of competence has provided me with a coherent way to discuss SRL competence and progress with my own students, their parents, and their teachers. Finally, the results of this investigation pertaining to highly self-regulated students with learning difficulties are particularly optimistic, enhancing my confidence when responding to teachers' concerns and enabling me to have more informed conversations with not only current students and their families, but with prospective students and their families during the admissions process, as well.

Filling gaps in the literature

According to Zimmerman (2008), the question that launched research on self-regulated learning is, 'How do students become masters of their own learning processes?' (p. 181). Although this question is pertinent for all students, to date SRL research has largely been undertaken in four-year universities or with convenience samples in middle class secondary schools (Usher and Schunk, 2018). Despite a careful review of the literature, I found few SRL studies involving IB Diploma Programme students or undertaken in international schools more generally, and none involving IB

Diploma students with learning difficulties. SRL research involving students with learning difficulties more generally is also less prevalent than research involving non-LD students (Klassen, 2010). Thus, this investigation's sample represents an under-researched population.

Furthermore, Caprara *et al* (2008) argue that 'advancing knowledge on academic self-development requires converging evidence from diverse methodologies because no one approach can do it alone' (p. 532). This view is widely shared in the field of self-regulated learning (Roll and Winne, 2015; Patrick and Middleton, 2002; Kaplan *et al*, 2011; Zimmerman, 2008; Cleary and Platten, 2013). The current study took this a step further by underscoring the utility of using an integrated theoretical lens, in addition to a multi-dimensional approach, to preserve the complexity of SRL as an 'approach.' Although this has repeatedly been called for by prominent researchers in the field (see Schunk and Greene, 2018; Järvenoja *et al*, 2015), theoretically integrated empirical research appears to be rare.

Another contribution to knowledge is the vital role of epistemic awareness to SRL. Epistemic awareness was not part of Winne and Hadwin's (1998) original theory, but it has gradually been gaining a foothold in SRL research generally (Sinatra and Taasoobshirazi, 2018; Muis and Singh, 2018), and within an information processing perspective specifically (Muis, 2007; Pieschl *et al*, 2014). Significantly, cognitive and metacognitive awareness did not comprehensively distinguish high- and low-quality work samples, but a critical, exploratory orientation and an inclination to validate knowledge claims (including self-evaluations of their own learning and performance) with evidence and reasoning featured in the approach of only the most highly regulated participants in this investigation.

The benefits of a multiplicative 'mastery by performance' orientation for the effectiveness of students' SRL is another contribution. A mastery approach orientation involving self-set standards (Usher and Schunk, 2018), is often considered most

conducive to SRL while findings related to performance goals are mixed (Kaplan *et al*, 2011). However, developing an accurate understanding of the task is a self-regulatory process from all three perspectives, and external criteria and standards can facilitate this (White and DiBenedetto, 2018). Dichotomising mastery and performance goals may not be relevant in a ‘fully aligned criterion-reference system’ (Biggs, 2012, p. 45) such as the DP.

6.5 Limitations

Stake (2006) points out that multiple case studies are so complex that they are usually conducted in teams, unless undertaken for a doctoral dissertation. This investigation was extremely complicated, presenting a challenge for analysis and coherent presentation of findings. Furthermore, given the large volume of data generated, I needed to engage in not only “progressive focusing” through multiple passes of the data (which is consistent with this type of qualitative multiple case study methodology), but I also felt the need to reduce the data to make comparisons within and across cases more manageable and to engage in intra-rater reliability checking, which is more consistent with a ‘positivist’ approach. Although this increased my confidence in my analysis, for some readers this could suggest an unease with the qualitative methods I had selected.

Additionally, this investigation was exploratory and did not seek to establish causal connections or generalisability. Underpinned by the stance that there is not one truth to be ‘revealed,’ but many possible perspectives to be explored, any links described were constructed, not ‘proven.’ Comparing within and across cases and quintains illuminated patterns in how SRL evolved, yet no two participants developed self-regulated learning or approached their learning in exactly the same way. Although Stake (2006) indicates that in multiple case study research between four and ten cases is

optimal, Miles and Huberman (1994) suggest that with high complexity more than fifteen cases can be unwieldy. A slightly larger sample, perhaps including ‘average’ students, may have allowed more patterns to emerge.

My insider status was another potential limitation of this investigation. Knowing me and my role at the school may have influenced whether participants decided to participate, which work samples they selected, how they reflected on these, and what they said during interviews and focus groups. I also had a personal stake in the outcomes of this investigation and needed to ensure I was learning from the data as opposed to seeing what I may have inadvertently hoped to see. Although this was accounted for through multiple passes of the data and a critical, reflexive stance, it also needs to be taken into consideration in the reading of this thesis.

6.6 Strengths

Boekaerts and Cascallar (2006) ask, ‘How far have we moved toward the integration of theory and practice in self-regulation?’ In the decade since they posed this question, SRL researchers have continued to call for integrated perspectives (Schunk and Greene, 2018; Järvenoja *et al*, 2015). This investigation responded to this call, resulting in comprehensive findings that preserved the complexity of SRL as situated in context. Therefore, although an integrated theoretical stance presented significant challenges for analysis and communicating results, it also represents an ambitious step in a direction called for by influential researchers in the field of self-regulated learning.

Its use of insider research was another aspect of this study that presented both limitations and opportunities. Importantly, this investigation responded to a particular need within this school and presented an invaluable professional learning opportunity for me in my role as Director of Specialist Programmes, as well as for my colleagues in terms of the professional development I can offer as a result of the findings.

Furthermore, as an 'IB insider,' I am aware that the research interests underpinning the design of this investigation also represent more wide-ranging concerns in IB schools offering the Diploma Programme. Although IB schools are diverse, I hope my findings present valuable insights to DP teachers not only in my school, but in other schools trying to balance 'delivery' of course content with student-centred, process-focused instruction and explicit instruction of ATL skills.

Moreover, this investigation's view of SRL as an 'approach' led to a multiple case study methodology that aligned well with a perspective of SRL as situated in context. The data collection methods enabled me to forensically analyse how participants went about their learning during their own independent study, why they selected particular strategies, how they learned those strategies, and what influences may have enhanced or constrained the development of their SRL. The combination of stimulated response and open-ended interview protocols, work samples, reflections, and teacher report comments to triangulate self-report data and illuminate SRL development over time appears to be novel. These methods resulted in extremely rich qualitative data that illuminated students' approaches to independent learning within the DP. This investigation's emphasis on reflexivity resulted in findings that can be trusted, and its detailed description of methods means that other researchers can potentially use this study as a 'prototype' to investigate SRL naturalistically in other contexts.

A final strength of this investigation is its attempt to not only understand how SRL evolved in participants in this context, but to synthesise the findings with practical guidance for DP teachers in Chapter 5. An Educational Doctorate should, first and foremost, demonstrate the potential to advance practitioner knowledge and practice. While 40 years of SRL research has revealed a huge amount of knowledge about SRL and SRL-enhancing practice, this has not yet been consistently translated to the classroom (Schunk and Greene, 2018). Dignath and Büttner (2008) speculate that one reason for this is that teachers do not receive enough practical guidance to help them

translate research findings into their day-to-day teaching. In this investigation, I attempted to address this gap through a clear and recursive discussion of how findings support the implementation of a student-centred teaching approach and explicit instruction of ATL skills, and how a student-centred approach, including explicit instruction of ATL skills, can promote self-regulated learning in DP students with learning difficulties and high-achievers.

6.7 Recommendations for further research

Given the compatibility between IB pedagogy (IB, 2016; IB 2014a; IB 2014b) and the large volume of research suggesting that it is student-centred, process-focused educational environments that support students in successfully directing their own learning (Black *et al*, 2006; Ross *et al*, 2003; Perrenoud, 1998; Sivan *et al*, 2000; James *et al*, 2006), perhaps IB programmes, including the ATL component, deserve more attention from SRL researchers. This is particularly important given the proliferation of similar curriculum objectives (Wolters, 2010; Black *et al*, 2006; James *et al*, 2006) and recent rapid expansion of IB schools (IB, 2019).

This investigation also highlights policy implications for the IB. Although its philosophy is underpinned by social constructivism (2014a) and ATL has increasingly been emphasised in DP curriculum updates (IB, 2015), the IB has not clarified the specific theoretical underpinnings of the ATL component of the curriculum. According to Timperly *et al* (2007), for teachers to implement new practices meaningfully, they must understand the theory underpinning those practices. Perhaps if the IB explicitly linked ATL with SRL, DP teachers would be more invested in explicitly teaching these skills. A pre-requisite to this would be to establish a body of research investigating possible links between the IB's ATL skills and self-regulated learning.

Furthermore, while IB schools have diverse features and are situated in varied cultural contexts, the DP ‘brand’ results in shared concerns amongst DP teachers (Hallinger *et al*, 2011). Stakeholders may assume that the DP is only suitable for high-achieving students, but this investigation suggests otherwise. However, empirical research involving IB Diploma Programme students with learning difficulties is rare. The rapid expansion of IB schools in this decade alone highlights a need to better understand the benefits and opportunities the DP offers these and other disadvantaged students.

6.8 Concluding remarks

Given empirical links between student-centred teaching and SRL, IB schools are well-positioned to create an educational context capable of enhancing students’ self-regulated learning. Moreover, because SRL promotes higher academic achievement, lifelong learning (Dignath and Büttner, 2008), and preparedness for a rapidly changing 21st Century world (Wolters, 2010), this appears to be a significant advantage of an IB education. However, to *develop* students’ SRL, IB schools must *understand* the construct of SRL. IB texts communicate the IB’s philosophy and translate this for schools into pedagogical guidance and professional development with the explicit purpose of ensuring IB students are able to take ownership of their own learning. However, this top down ‘telling’ in the face of a highly rigorous curriculum, external examinations, and expectations regarding access to top-tier universities is not always enough to shift ‘traditional’ beliefs that, despite the constructivist underpinnings of the curriculum, remain prevalent in many IB schools. Without sufficient evidence contradicting their own beliefs, there will always be school leaders who remain convinced, ‘this is not applicable to my school’ and teachers who argue, ‘this is not true for my subject.’

Teachers and school leaders need access to research that ‘speaks’ to them. It is thus vitally important to further our understanding of how SRL develops in not only IB students, but in young people from diverse backgrounds, by speaking to real students in diverse educational settings about their experiences and perspectives, how they go about academic their work, and why they do so in the way that they do. It is also crucial to find and study diverse educational contexts in which effective SRL-promoting practice is the norm, so that successful practices and their impact on both students’ SRL and their achievement can be widely shared, potentially breaking the ‘glass ceiling’ that constrains the development of these practices in some schools. As a teacher dedicated to supporting the SRL in DP students of all abilities, I believe that theoretically integrated case study research has promise for providing a fuller picture that resonates for teachers and school leaders because it preserves the complexity of SRL and its development in real students in real educational settings.

List of References

- Anyichie, A. C., & Butler, D. L. (2015). The academic implications of supporting the development of self-regulated learning through modelling and scaffolding. In *Canadian Association of Educational Psychologists (CAEP) Symposium, Understanding and supporting Self-regulated learning. Presented during the annual meeting of Canadian Society for the Study of Education, Ottawa, ON*, 1-7.
- Anyichie, A. C., & Butler, D. L. (2017). A culturally responsive self-regulated learning framework. In P. Chen (Session Organizer), *Examining synergistic relationships among self-regulated learning and motivational variables. Presented during the annual meeting of the America Educational Research Association, San Antonio, Texas*, 1-29.
- Anyichie, A. C., Yee, N., Perry, N., & Hutchinson, L. R. (2016). Supporting culturally diverse students with self-regulated learning. In *annual meeting of Canadian Society for the Study of Education (CSSE)*.
- Avis, M., & Freshwater, D. (2006). Evidence for practice, epistemology, and critical reflection. *Nursing Philosophy*, 7(4), 216-224.
- Azevedo, R., Moos, D. C., Greene, J. A., Winters, F. I., & Cromley, J. G. (2008). Why is externally-facilitated regulated learning more effective than self-regulated learning with hypermedia?. *Educational Technology Research and Development*, 56(1), 45-72.
- Baeten, M., Kyndt, E., Struyven, K., & Dochy, F. (2010). Using student-centred learning environments to stimulate deep approaches to learning: Factors encouraging or discouraging their effectiveness. *Educational Research Review*, 5(3), 243-260.
- Baslanti, U., & McCoach, D. B. (2006). Factors related to the underachievement of university students in Turkey. *Roeper Review*, 28(4), 210-215.
- Bassey, M. (1999). *Case study research in educational settings*. McGraw-Hill Education (UK).
- Biggs, J. (1993). What do inventories of students' learning processes really measure? A theoretical review and clarification. *British journal of educational psychology*, 63(1), 3-19.
- Biggs, J. (2012). What the student does: teaching for enhanced learning. *Higher Education Research & Development*, 31(1), 39-55.
- Biggs, J., Kember, D., & Leung, D. Y. (2001). The revised two-factor study process questionnaire: R-SPQ-2F. *British journal of educational psychology*, 71(1), 133-149.
- Bjork, E. L., & Bjork, R. (2011). Making things hard on yourself, but in a good way. In *Gernsbacher MA, Pew RW, Hough LM, Pomerantz JR, Psychology in the Real World, New York: Worth*.
- Bjork, R. A., Dunlosky, J., & Kornell, N. (2013). Self-regulated learning: Beliefs, techniques, and illusions. *Annual review of psychology*, 64, 417-444.
- Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the black box: Assessment for learning in the classroom. *Phi delta kappan*, 86(1), 8-21.

- Black, P., McCormick, R., James, M., & Pedder, D. (2006). Learning how to learn and assessment for learning: A theoretical inquiry. *Research Papers in Education*, 21(02), 119-132.
- Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability (formerly: Journal of Personnel Evaluation in Education)*, 1(1), 1-40.
- Black, P., & Wiliam, D. (2010). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, 92(1), 81-90.
- Boekaerts, M., & Cascallar, E. (2006). How far have we moved toward the integration of theory and practice in self-regulation? *Educational Psychology Review*, 18(3), 199-210.
- Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational researcher*, 18(1), 32-42.
- Bruer, J. (1997). Intelligent novices: Knowing how to learn. In *Schools for thought: A science of learning in the classroom*, Cambridge: The MIT Press, 51-79.
- Butler, D. L. (2002a). Individualizing instruction in self-regulated learning. *Theory into practice*, 41(2), 81-92.
- Butler, D. L. (2002b). Qualitative approaches to investigating self-regulated learning: Contributions and challenges. *Educational psychologist*, 37(1), 59-63.
- Butler, D.L. & Cartier, S. (2018). Advancing research and practice about self-regulated learning: the promise of in-depth case study methodologies. *The handbook of self-regulation of learning and performance*, 352-369. Oxon: Routledge.
- Butler, D. L., Cartier, S. C., Schnellert, L., Gagnon, F., & Giammarino, M. (2011). Secondary students' self-regulated engagement in reading: researching self-regulation as situated in context. *Psychological Test and Assessment Modeling*, 53(1), 73-105.
- Butler, D. L., Perry, N. E., & Schnellert, L. (2017). *Developing self-regulating learners*. Pearson Canada Incorporated.
- Butler, D. L., & Schnellert, L. (2015). Success for students with learning disabilities: What does self-regulation have to do with it. *Self-regulated learning interventions with at-risk youth: Enhancing adaptability, performance, and well-being being*, 89-112.
- Butler, D. L., Schnellert, L., & Cartier, S. C. (2013). Layers of Self-and Co-Regulation: Teachers Working Collaboratively to Support Adolescents' Self-Regulated Learning through Reading. *Education Research International*, 2013.
- Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of educational research*, 65(3), 245-281.

- Caprara, G. V., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G. M., Barbaranelli, C., & Bandura, A. (2008). Longitudinal analysis of the role of perceived self-efficacy for self-regulated learning in academic continuance and achievement. *Journal of educational psychology*, 100(3), 525.
- Carber, S., & Reis, S. (2004). Commonalities in IB practice and the schoolwide enrichment model. *Journal of Research in International Education*, 3(3), 339-359.
- Cascallar, E., Boekaerts, M., & Costigan, T. (2006). Assessment in the evaluation of self-regulation as a process. *Educational Psychology Review*, 18(3), 297-306.
- Chen, P. & Benbenutty, H. (2018). Calibration of performance and academic delay of gratification: Individual and group differences in self-regulation of learning. *The handbook of self-regulation of learning and performance*, 407-420. Oxon: Routledge.
- Cleary, T. J. (2006). The development and validation of the self-regulation strategy inventory—self-report. *Journal of school psychology*, 44(4), 307-322.
- Cleary, T. J., & Platten, P. (2013). Examining the correspondence between self-regulated learning and academic achievement: A case study analysis. *Education Research International*, 2013.
- Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools*, 41(5), 537-550.
- Clemons, T. L. (2008). Underachieving Gifted Students: A Social Cognitive Model. *National Research Center on the Gifted and Talented*.
- Clinkenbeard, P. R. (2012). Motivation and gifted students: Implications of theory and research. *Psychology in the Schools*, 49(7), 622-630.
- Codrington, S. (2004). Applying the concept of ‘best practice’ to international schools. *Journal of Research in International Education*, 3(2), 173-188.
- Colangelo, N., Kerr, B., Christensen, P., & Maxey, J. (1993). A comparison of gifted underachievers and gifted high achievers. *Gifted Child Quarterly*, 37(4), 155-160.
- Collins, A., Brown, J. S., & Holum, A. (1991). Cognitive apprenticeship: Making thinking visible. *American educator*, 15(3), 6-11.
- Conley, D., McGaughy, C., Davis-Molin, W., Farkas, R., & Fukuda, E. (2014). International Baccalaureate Diploma Programme: Examining College Readiness. *Educational Policy Improvement Center*.
- Cortiella, C. & Horowitz, S.H. (2014). *The state of learning disabilities: Facts, trends, and emerging issues*. New York: National Center for Learning Disabilities.
- Culross, R., & Tarver, E. (2011). A summary of research on the International Baccalaureate Diploma Programme: Perspectives of students, teachers, and university admissions offices in the USA. *Journal of Research in International Education*, 10(3), 231-243.

- Dann, R. (2014). Assessment as learning: blurring the boundaries of assessment and learning for theory, policy and practice. *Assessment in Education: Principles, Policy & Practice*, 21(2), 149-166.
- De Groot, E. V. (2002). Learning through interviewing: Students and teachers talk about learning and schooling. *Educational psychologist*, 37(1), 41-52.
- Dignath, C., & Büttner, G. (2008). Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and learning*, 3(3), 231-264.
- Dinsmore, D. L., & Alexander, P. A. (2012). A critical discussion of deep and surface processing: What it means, how it is measured, the role of context, and model specification. *Educational Psychology Review*, 24(4), 499-567.
- Dombrowski, E., Mackenzie, J., and Clarke, M. (2010). Perspectives on a curious subject: What is IB theory of knowledge all about? Cardiff: International Baccalaureate.
- Donker, A. S., de Boer, H., Kostons, D., Van Ewijk, C. D., & van der Werf, M. P. (2014). Effectiveness of learning strategy instruction on academic performance: A meta-analysis. *Educational Research Review*, 11, 1-26.
- Dweck, C. (2015). Carol Dweck revisits the growth mindset. *Education Week*, 35(5), 20-24.
- Emerick, L. J. (1992). Academic underachievement among the gifted: Students' perceptions of factors that reverse the pattern. *Gifted Child Quarterly*, 36(3), 140-146.
- Felder, R. M., & Brent, R. (2005). Understanding student differences. *Journal of engineering education*, 94(1), 57-72.
- Field, S., Martin, J., Miller, R., Ward, M., & Wehmeyer, M. (1998). *A Practical Guide for Teaching Self-Determination*. Council for Exceptional Children. Reston: CEC Publications.
- Field, S., Sarver, M. D., & Shaw, S. F. (2003). Self-determination: A key to success in postsecondary education for students with learning disabilities. *Remedial and Special Education*, 24(6), 339-349.
- Firth, N., Frydenberg, E., & Greaves, D. (2008). Perceived control and adaptive coping: Programs for adolescent students who have learning disabilities. *Learning Disability Quarterly*, 31(3), 151-165.
- Flavell, J. H. (1979). Metacognitive and cognitive monitoring: A new area of cognitive development inquiry. *American Psychologist*, 906-911.
- Flum, H., & Kaplan, A. (2006). Exploratory orientation as an educational goal. *Educational Psychologist*, 41(2), 99-110.
- Forrests, S. (2017). A formative assessment and summative evaluation of a teachers' continuing professional development programme. *Institution Focused Study*. King's College, London. Unpublished.

- Forrests, S. (2018). Can CPD enhance student-centred teaching and encourage explicit instruction of International Baccalaureate Approaches to Learning skills? A qualitative formative assessment and summative evaluation of an IB school's in-house CPD programme. *Journal of Research in International Education*, 17(3), 262-285.
- Freebody, P. (2003). *Qualitative research in education: Interaction and practice*. Sage.
- Gagne, F. (2003). Transforming gifts into talents: The DMGT as a developmental theory. *Handbook of gifted education*, 3, 60-74.
- Gallagher, J. J. (2003). Issues and challenges in the education of gifted students. *Handbook of gifted education*, 3rd edition, 60-74.
- Gaultney, J. F. (1998). Differences in benefit from strategy use: What's good for me may not be so good for thee. *Journal for the Education of the Gifted*, 21(2), 160-178.
- Gibbs, G., & Coffey, M. (2004). The impact of training of university teachers on their teaching skills, their approach to teaching and the approach to learning of their students. *Active learning in higher education*, 5(1), 87-100.
- Hadwin, A. F. (2013). Response to Vassallo's claims from a historically situated view of self-regulated learning as adaptation in the face of challenge. *New Ideas in Psychology*, 31(3), 212-215.
- Hadwin, A.F., Boutara, L., Knoetzke, T., & Thompson, S. (2004). Cross-case study of self-regulated learning as a series of events. *Educational Research and Evaluation*, 10(4-6), 365-417.
- Hadwin, A.F., Järvelä, S., & Miller, M. (2018). Self-regulation, shared regulation, and co-regulation in collaborative learning environments. *The handbook of self-regulation of learning and performance*, 83-106. Oxon: Routledge.
- Hallinger, P., Lee, M., & Walker, A. (2011). Program transition challenges in International Baccalaureate schools. *Journal of Research in International Education*, 10(2), 123-136.
- Harris, K. R., & Graham, S. (1999). Programmatic intervention research: Illustrations from the evolution of self-regulated strategy development. *Learning Disability Quarterly*, 22(4), 251-262.
- Hattie, J., Biggs, J., & Purdie, N. (1996). Effects of learning skills interventions on student learning: A meta-analysis. *Review of educational research*, 66(2), 99-136.
- Havnes, A., Smith, K., Dysthe, O., & Ludvigsen, K. (2012). Formative assessment and feedback: Making learning visible. *Studies in Educational Evaluation*, 38(1), 21-27.
- Heikkilä, A., & Lonka, K. (2006). Studying in higher education: students' approaches to learning, self-regulation, and cognitive strategies. *Studies in higher education*, 31(1), 99-117.
- Hen, M., & Goroshit, M. (2014). Academic procrastination, emotional intelligence, academic self-efficacy, and GPA: A comparison between students with and without learning disabilities. *Journal of learning disabilities*, 47(2), 116-124.

- Hertberg-Davis, H., & Callahan, C. M. (2008). A narrow escape: Gifted students' perceptions of Advanced Placement and International Baccalaureate programs. *Gifted Child Quarterly*, 52(3), 199-216.
- Hillocks, G. (1999) *Ways of Thinking, Ways of Teaching*. New York: Teachers College Press.
- Hitchcock, G., & Hughes, D. (1995). *Research and the teacher: A qualitative introduction to school-based research*. Psychology Press.
- Hoyle, R.H. & Dent, A. (2018). Developmental trajectories of skills and abilities relevant for self-regulation of learning and performance. *The handbook of self-regulation of learning and performance*, 49-63. Oxon: Routledge.
- Hübner, S., Nückles, M., & Renkl, A. (2010). Writing learning journals: Instructional support to overcome learning-strategy deficits. *Learning and Instruction*, 20(1), 18-29.
- Hwang, M. H., Lee, D., Lim, H. J., Seon, H. Y., Hutchison, B., & Pope, M. (2014). Academic underachievement and recovery: Student perspectives on effective career interventions. *The Career Development Quarterly*, 62(1), 81-94.
- International Baccalaureate. (2006). *IB Learner profile booklet*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2008). *Towards a continuum of international education*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2009). *The IB Diploma Programme: From Principles into Practice*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2010). *Learning diversity in the International Baccalaureate Programmes: Special educational needs within the International Baccalaureate programmes*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2011) *Report on the Programme Evaluation*. Cardiff: International Baccalaureate Organisation, Ltd. Unpublished accreditation report.
- International Baccalaureate. (2014a). *MYP: From Principles into Practice*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2014b). *Programme standards and practices*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2015). *Approaches to teaching and learning in the International Baccalaureate (IB) Diploma Programme*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2016). *Guide to the International Baccalaureate Diploma Programme*. Cardiff: International Baccalaureate.
- International Baccalaureate. (2018). *Access and inclusion policy*. Cardiff: International Baccalaureate.

International Baccalaureate. (2019). Facts about IB programmes and schools. Accessed January 20, 2019. Available at <https://www.ibo.org/about-the-ib/facts-and-figures/>

James, M., Black, P., McCormick, R., Pedder, D., & Wiliam, D. (2006). Learning how to learn, in classrooms, schools and networks: Aims, design and analysis. *Research Papers in Education*, 21(02), 101-118.

Janssen, J., Kirschner, F., Erkens, G., Kirschner, P. A., & Paas, F. (2010). Making the black box of collaborative learning transparent: Combining process-oriented and cognitive load approaches. *Educational psychology review*, 22(2), 139-154.

Järvenoja, H., Järvelä, S., & Malmberg, J. (2015). Understanding regulated learning in situative and contextual frameworks. *Educational Psychologist*, 50(3), 204-219.

Johnson, D. W., & Johnson, R. T. (1979). Conflict in the classroom: Controversy and learning. *Review of educational research*, 49(1), 51-69.

Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational researcher*, 38(5), 365-379.

Jones, A. B., Sherman, R. A., & Hogan, R. T. (2017). Where is ambition in factor models of personality?. *Personality and Individual Differences*, 106, 26-31.

Kaplan, A., Lichtinger, E., & Margulis, M. (2011). The situated dynamics of purposes of engagement and self-regulation strategies: A mixed-methods case study of writing. *Teachers College Record*, 113(2), 284-324.

Karpicke, J. D., Butler, A. C., & Roediger III, H. L. (2009). Metacognitive strategies in student learning: do students practise retrieval when they study on their own?. *Memory*, 17(4), 471-479.

Kember, D. (2001). Beliefs about knowledge and the process of teaching and learning as a factor in adjusting to study in higher education. *Studies in Higher Education*, 26(2), 205-221.

Kember, D., Biggs, J., & Leung, D. Y. (2004). Examining the multidimensionality of approaches to learning through the development of a revised version of the Learning Process Questionnaire. *British Journal of Educational Psychology*, 74(2), 261-279.

King, P. M., & Kitchener, K. S. (2004). Reflective judgment: Theory and research on the development of epistemic assumptions through adulthood. *Educational psychologist*, 39(1), 5-18.

Kinsella, E. A. (2007). Embodied reflection and the epistemology of reflective practice. *Journal of Philosophy of Education*, 41(3), 395-409.

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational psychologist*, 41(2), 75-86.

- Klassen, R. M. (2010). Confidence to manage learning: The self-efficacy for self-regulated learning of early adolescents with learning disabilities. *Learning Disability Quarterly*, 33(1), 19-30.
- Li, Na (2012) *Approaches to Learning: Literature Review*, International Baccalaureate Organization, 1-34.
- Lichtinger, E., & Kaplan, A. (2015). Employing a case study approach to capture motivation and self-regulation of young students with learning disabilities in authentic educational contexts. *Metacognition and learning*, 10(1), 119-149.
- Lising, L., & Elby, A. (2005). The impact of epistemology on learning: A case study from introductory physics. *American Journal of Physics*, 73(4), 372-382.
- Mannion, J., & Mercer, N. (2016). Learning to learn: improving attainment, closing the gap at Key Stage 3. *The Curriculum Journal*, 27(2), 246-271.
- Marton, F., & Säljö, R. (1976). Outcome as a function of the learner's conception of the task. *British Journal of Educational Psychology*, 46, 115-127.
- Mason, L. & Reid, R. (2018). Self-regulation: Implications for individuals with special needs. *The handbook of self-regulation of learning and performance*, 473-484. Oxon: Routledge.
- McCabe, J. (2011). Metacognitive awareness of learning strategies in undergraduates. *Memory & Cognition*, 39(3), 462-476.
- Matthews, D. J., & Foster, J. F. (2005). Mystery to mastery: Shifting paradigms in gifted education. *Roeper Review*, 28(2), 64-69.
- Matthews, D., & Kitchen, J. (2007). School-within-a-school gifted programs: Perceptions of students and teachers in public secondary schools. *Gifted Child Quarterly*, 51(3), 256-271.
- Matthews, M. S., & McBee, M. T. (2007). School factors and the underachievement of gifted students in a talent search summer program. *Gifted Child Quarterly*, 51(2), 167-181.
- McCabe, J. (2011). Metacognitive awareness of learning strategies in undergraduates. *Memory & Cognition*, 39(3), 462-476.
- McCoach, D. B., & Siegle, D. (2003). Factors that differentiate underachieving gifted students from high-achieving gifted students. *Gifted child quarterly*, 47(2), 144-154.
- Meyer, D. K., & Turner, J. C. (2002). Using instructional discourse analysis to study the scaffolding of student self-regulation. *Educational psychologist*, 37(1), 17-25.
- Miles, M. B., & Huberman, A. M. (1994) *Qualitative Data Analysis: An expanded sourcebook*. London: SAGE.
- Miranda, A., Villaescusa, M. I., & Vidal-Abarca, E. (1997). Is attribution retraining necessary? Use of self-regulation procedures for enhancing the reading comprehension strategies of children with learning disabilities. *Journal of Learning Disabilities*, 30(5), 503-512.

- Molander, B. (2008). " Have I kept inquiry moving?" On the Epistemology of Reflection. *Phenomenology & Practice*, 2(1).
- Montague, M. (2008). Self-regulation strategies to improve mathematical problem solving for students with learning disabilities. *Learning Disability Quarterly*, 31(1), 37-44.
- Morisano, D., & Shore, B. M. (2010). Can personal goal setting tap the potential of the gifted underachiever?. *Roeper Review*, 32(4), 249-258.
- Muil, W., Hussin, Z., Mamat, W. H. W., Mohamed, M. F., & Zailani, M. A. (2013). The relationship between epistemological beliefs and metacognitive thinking of gifted and non-gifted students. *Journal of American Science*, 9(10), 313-319.
- Muis, K. R. (2007). The role of epistemic beliefs in self-regulated learning. *Educational Psychologist*, 42(3), 173-190.
- Muis, K.R. & Singh, C. (2018). The three facets of epistemic thinking in self-regulated learning. *The handbook of self-regulation of learning and performance*, 434-456. Oxon: Routledge.
- Munro, J. (2003). The influence of student learning characteristics on progress through the extended essay: A component of the International Baccalaureate Diploma programme. *Journal of Research in International Education*, 2(1), 5-24.
- Nelson, J. R., Smith, D. J., & Dodd, J. M. (1992). The effects of teaching a summary skills strategy to students identified as learning disabled on their comprehension of science text. *Education and Treatment of Children*, 228-243.
- Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in higher education*, 31(2), 199-218.
- O'Boyle, É. (2009). Whispers from within: Students' perceptions of the first year of the International Baccalaureate Middle Years Programme in an international school. *Journal of Research in International Education*, 8(1), 30-56.
- Pajares, F., & Kranzler, J. (1995). Self-efficacy beliefs and general mental ability in mathematical problem-solving. *Contemporary educational psychology*, 20(4), 426-443.
- Pajares, F., & Valiante, G. (2002). Students' self-efficacy in their self-regulated learning strategies: A developmental perspective. *Psychologia*, 45(4), 211-221.
- Patrick, H., & Middleton, M. J. (2002). Turning the kaleidoscope: What we see when self-regulated learning is viewed with a qualitative lens. *Educational psychologist*, 37(1), 27-39.
- Perrenoud, P. (1998). From formative evaluation to a controlled regulation of learning processes. Towards a wider conceptual field. *Assessment in Education: Principles, Policy & Practice*, 5(1), 85-102.
- Perry, N. E. (2004). Using Self-Regulated Learning to Accommodate Differences amongst Students in Classrooms. *Exceptionality Education Canada*, 14(n2&3), 65-87.

Perry, N.E., Hutchinson, L.R., Yee, N., & Määttä, E. (2018). Advances in understanding young children's self-regulation of learning. *The handbook of self-regulation of learning and performance*, 434-472. Oxon: Routledge.

Perry, N. E., VandeKamp, K. O., Mercer, L. K., & Nordby, C. J. (2002). Investigating teacher-student interactions that foster self-regulated learning. *Educational psychologist*, 37(1), 5-15.

Peterson, J. S. (2000). A follow-up study of one group of achievers and underachievers four years after high school graduation. *Roeper review*, 22(4), 217-224.

Peterson, J. S., & Colangelo, N. (1996). Gifted achievers and underachievers: A comparison of patterns found in school files. *Journal of Counseling & Development*, 74(4), 399-407.

Pieschl, S., Stahl, E., Murray, T., & Bromme, R. (2012). Is adaptation to task complexity really beneficial for performance?. *Learning and Instruction*, 22(4), 281-289.

Pieschl, S., Stallmann, F., & Bromme, R. (2014). High School Students' Adaptation of Task Definitions, Goals and Plans to Task Complexity–The Impact of Epistemic Beliefs. *Psihologijske teme*, 23(1), 31-52.

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International journal of educational research*, 31(6), 459-470.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of educational Psychology*, 95(4), 667.

Poelzer, G. H., & Feldhusen, J. F. (1997). The International Baccalaureate: A program for gifted secondary students. *Roeper Review*, 19(3), 168-171.

Procee, H. (2006). Reflection in education: A Kantian epistemology. *Educational Theory*, 56(3), 237-253.

Reid, M. (2011). Teaching implications of gifted and talented learners within the mainstream classroom. *Journal of Student Engagement: Education Matters*, 1(1), 29-32.

Reis, S. M., & McCoach, D. B. (2000). The underachievement of gifted students: What do we know and where do we go?. *Gifted child quarterly*, 44(3), 152-170.

Reis, S. M., McGuire, J. M., & Neu, T. W. (2000). Compensation strategies used by high-ability students with learning disabilities who succeed in college. *Gifted Child Quarterly*, 44(2), 123-134.

Reis, S. M., & Renzulli, J. S. (2010). Is there still a need for gifted education? An examination of current research. *Learning and individual differences*, 20(4), 308-317.

Renzulli, J. S. (1988). A decade of dialogue on the three-ring conception of giftedness. *Roeper Review*, 11(1), 18-25.

Renzulli, J. S. (2012). Reexamining the role of gifted education and talent development for the 21st century: A four-part theoretical approach. *Gifted Child Quarterly*, 56(3), 150-159.

- Ritchotte, J. A., Matthews, M. S., & Flowers, C. P. (2014). The validity of the achievement-orientation model for gifted middle school students: An exploratory study. *Gifted Child Quarterly*, 58(3), 183-198.
- Roll, I., Wiese, E. S., Long, Y., Aleven, V., & Koedinger, K. R. (2014). Tutoring self- and co-regulation with intelligent tutoring systems to help students acquire better learning skills. *Design recommendations for intelligent tutoring systems*, 2, 169-182.
- Roll, I., & Winne, P. H. (2015). Understanding, evaluating, and supporting self-regulated learning using learning analytics. *Journal of Learning Analytics*, 2(1), 7-12.
- Ross, M. E., Salisbury-Glennon, J. D., Guarino, A., Reed, C. J., & Marshall, M. (2003). Situated self-regulation: Modeling the interrelationships among instruction, assessment, learning strategies and academic performance. *Educational Research and Evaluation*, 9(2), 189-209.
- Ruban, L. M., McCoach, D. B., McGuire, J. M., & Reis, S. M. (2003). The differential impact of academic self-regulatory methods on academic achievement among university students with and without learning disabilities. *Journal of Learning Disabilities*, 36(3), 270-286.
- Ruban, L., & Reis, S. M. (2006). Patterns of self-regulatory strategy use among low-achieving and high-achieving university students. *Roeper Review*, 28(3), 148-156.
- Rubenstein, L. D., Siegle, D., Reis, S. M., McCoach, D. B., & Burton, M. G. (2012). A complex quest: The development and research of underachievement interventions for gifted students. *Psychology in the Schools*, 49(7), 678-694.
- Ruiz-Primo, M. A. (2011). Informal formative assessment: The role of instructional dialogues in assessing students' learning. *Studies in Educational Evaluation*, 37(1), 15-24.
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary educational psychology*, 25(1), 54-67.
- Schön, D. A. (1995). Knowing-in-action: The new scholarship requires a new epistemology. *Change: The Magazine of Higher Learning*, 27(6), 27-34.
- Schultz, R. A. (2002). Illuminating realities: A phenomenological view from two underachieving gifted learners. *Roeper Review*, 24(4), 203-212.
- Schunk, D. H. (2005). Commentary on self-regulation in school contexts. *Learning and Instruction*, 15(2), 173-177.
- Schunk, D. H., & Ertmer, P. A. (2000). Self-regulation and academic learning: Self-efficacy enhancing interventions. In *Handbook of self-regulation* (pp. 631-649).
- Schunk, D. H., & Greene, J.A. (2018). Historical, Contemporary, and Future Perspectives on Self-Regulation and Performance. *The handbook of self-regulation of learning and performance*, 1-15. Oxon: Routledge.
- Schunk, D. H., & Zimmerman, B. J. (2007). Influencing children's self-efficacy and self-regulation of reading and writing through modeling. *Reading & writing quarterly*, 23(1), 7-25.

- Shaunessy, E., & Suldo, S. M. (2010). Strategies used by intellectually gifted students to cope with stress during their participation in a high school International Baccalaureate program. *Gifted Child Quarterly*, 54(2), 127-137.
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, 22(2), 63-75.
- Sideridis, G. D. (2006). Achievement goal orientations, "oughts," and self-regulation in students with and without learning disabilities. *Learning Disability Quarterly*, 29(1), 3-18.
- Sideridis, G. D., & Scanlon, D. (2006). Motivational issues in learning disabilities. *Learning Disability Quarterly*, 29(3), 131-135.
- Sinatra, G. & Taasobshirazi, G. (2018). The self-regulation of learning and conceptual change in science: Research, theory, and educational applications. *The handbook of self-regulation of learning and performance*, 153-165. Oxon: Routledge.
- Siskin, L. S., Weinstein, M., & Sperling, R. (2010). TO BE IB: Creating support structures and services for title I high schools implementing the international baccalaureate programme. *NYU Wagner Research Paper*, (2011-11).
- Sivan, A., Leung, R. W., Woon, C. C., & Kember, D. (2000). An implementation of active learning and its effect on the quality of student learning. *Innovations in education and training international*, 37(4), 381-389.
- Somekh, B., & Lewin, C. (Eds.). (2011). *Theory and methods in social research*. Sage.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: SAGE Publications.
- Stake, R. E. (2006). *Multiple case study analysis*. Guilford Press.
- Spooren, P., & Mortelmans, D. (2006). Teacher professionalism and student evaluation of teaching: Will better teachers receive higher ratings and will better students give higher ratings?. *Educational Studies*, 32(2), 201-214.
- Stålné, K., Kjellström, S., & Utriainen, J. (2016). Assessing complexity in learning outcomes—a comparison between the SOLO taxonomy and the model of hierarchical complexity. *Assessment & Evaluation in Higher Education*, 41(7), 1033-1048.
- Sternberg, R. J. (2003). Giftedness according to the theory of successful intelligence. *Handbook of gifted education*, 3, 88-99.
- Stoeger, H., & Ziegler, A. (2005). Evaluation of an Elementary Classroom Self-Regulated Learning Program for Gifted Mathematics Underachievers. *International Education Journal*, 6(2), 261-271.
- Subotnik, R. F., Olszewski-Kubilius, P., & Worrell, F. C. (2011). Rethinking giftedness and gifted education: A proposed direction forward based on psychological science. *Psychological science in the public interest*, 12(1), 3-54.
- Tannenbaum, A. J. (2003). Nature and nurture of giftedness. *Handbook of gifted education*, 3, 45-59.

- Taylor, M. L., & Porath, M. (2006). Reflections on the International Baccalaureate program: Graduates' perspectives. *Journal of Secondary Gifted Education*, 17(3), 149-158.
- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development: Best evidence synthesis iteration*. Ministry of Education.
- Toering, T., Elferink-Gemser, M. T., Jordet, G., Pepping, G. J., & Visscher, C. (2012). Self-regulation of learning and performance level of elite youth soccer players. *International Journal of Sport Psychology*, 43(4), 312.
- Tookey, M. E. (1999). The International Baccalaureate: A program conducive to the continued growth of the gifted adolescent. *Journal of Secondary Gifted Education*, 11(2), 52-66.
- Torrance, H. (2012). Triangulation, respondent validation, and democratic participation in mixed methods research. *Journal of mixed methods research*, 6(2), 111-123.
- Trainin, G., & Swanson, H. L. (2005). Cognition, metacognition, and achievement of college students with learning disabilities. *Learning Disability Quarterly*, 28(4), 261-272.
- Twigg, V. V. (2010) Teachers' Practices, Values and Beliefs for Successful Inquiry-based Teaching in the International Baccalaureate Primary Years Programme. *Journal of Research in International Education*, 9(1), 40-65.
- Usher, E. L., & Pajares, F. (2008). Self-efficacy for self-regulated learning: A validation study. *Educational and Psychological Measurement*, 68(3), 443-463.
- Usher, E. and Schunk, D. (2018). Social Cognitive Theoretical Perspective of Self-Regulation. *The handbook of self-regulation of learning and performance*, 208-222. Oxon: Routledge.
- VanTassel-Baska, J. (1997). Excellence as a standard for all education. *Roeper Review*, 20(1), 9-12.
- VanTassel-Baska, J. (2000). Curriculum policy development for secondary gifted programs: A prescription for reform coherence. *NASSP Bulletin*, 84(615), 14-29.
- Watson, S. M., Gable, R. A., & Morin, L. L. (2016). The role of executive functions in classroom instruction of students with learning disabilities. *International Journal of School and Cognitive Psychology*, 3(167).
- Wells, J. (2011). International education, values and attitudes: A critical analysis of the International Baccalaureate (IB) Learner Profile. *Journal of Research in International Education*, 10(2), 174-188.
- White, M. & DiBenedetto, M. (2018). Self-regulation: An integral part of standards-based education. *The handbook of self-regulation of learning and performance*, 19-35. Oxon: Routledge.
- Wiliam, D. (2011). What is assessment for learning?. *Studies in educational evaluation*, 37(1), 3-14.

- Winne, P. H. (1995). Inherent details in self-regulated learning. *Educational psychologist*, 30(4), 173-187.
- Winne, P. H. (1997). Experimenting to bootstrap self-regulated learning. *Journal of educational Psychology*, 89(3), 397.
- Winne, P. H. (2010). Improving measurements of self-regulated learning. *Educational Psychologist*, 45(4), 267-276.
- Winne, P.H. (2018). Cognition and metacognition within self-regulated learning. *The handbook of self-regulation of learning and performance*, 36-48. Oxon: Routledge.
- Winne, P. H., & Hadwin, A. F. (1998). Studying as self-regulated learning. *Metacognition in educational theory and practice*, 93, 27-30.
- Wolters, C. A. (2010). Self-regulated learning and the 21st century competencies. *Universidad de Houston: Department of Educational Psychology*. Consultado en: http://www.hewlett.org/uploads/Self_Regulated_Learning__21st_Century_Competencies.pdf.
- Wolters, C.A. & Won, S. (2018). Validity and the use of self-report questionnaires to assess self-regulated learning. *The handbook of self-regulation of learning and performance*, 307-322. Oxon: Routledge.
- Wright, K. (2015). International Baccalaureate programmes: Longer-term outcomes.
- Yaworski, J., Weber, R. M., & Ibrahim, N. (2000). What makes students succeed or fail?: The voices of developmental college students. *Journal of College Reading and Learning*, 30(2), 195-221.
- Ziegler, A., Ziegler, A., & Stoeger, H. (2012). Shortcomings of the IQ-based construct of underachievement. *Roeper Review*, 34(2), 123-132.
- Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of educational psychology*, 81(3), 329.
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational psychologist*, 25(1), 3-17.
- Zimmerman, B. (1999). Commentary: toward a cyclically interactive view of self-regulated learning. *Educational Research*, 31(545), 551.
- Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary educational psychology*, 25(1), 82-91.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into practice*, 41(2), 64-70.
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American educational research journal*, 45(1), 166-183.

Zimmerman, B. J., & Pons, M. M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American educational research journal*, 23(4), 614-628.

Zimmerman, B. J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of educational Psychology*, 82(1), 51.

Appendix A: Initial start List of Codes (partial)

Category	Description	Code	Research question
Self-regulated learning (SRL)	goal-setting, strategy use, context adaptations, social processes and self-monitoring		
Personal influences on SRL (P-SRL)	Self-efficacy Motivation Goal-setting Goals (Mastery-approach) Goals (Mastery-avoidance) Goals (Performance-approach) Goals (Performance-avoidance) Locus of control (internal) Locus of control (external) Knowledge (declarative) Knowledge (procedural) Knowledge (conditional) Knowledge (metacognitive) Affect Attention Persistence Cognitive awareness Metacognitive awareness Epistemic awareness	P-SRL-SE P-SRL-M P-SRL-GS P-SRL-GMAP P-SRL-GMAV P-SRL-GPAP P-SRL-GPAV P-SRL-LCI P-SRL-LCE P-SRL-KD P-SRL-KP P-SRL-KC P-SRL-KM P-SRL-AF P-SRL-AT P-SRL-P P-SRL-CA P-SRL-Met P-SRL-E	
Behavioural influences on SRL (B-SRL)	Self-observation (monitoring of strategic/non-strategic response) Self-judgement Self-reactions	B-SRL-SO B-SRL-SJ B-SRL-SR	
Environmental Influences on SRL (E-SRL)	Enactive outcomes Modelling Verbal persuasion Help Symbolic forms of information (diagrams, pictures, formulas) Peers	E-SRL-EO E-SRL-M E-SRL-VP E-SRL-H E-SRL-SFI E-SRL-P	
Strategy use (St)			
Personal control strategies (St-P)	Communication <i>Transforming</i> Organisation <i>Goal-setting</i> <i>Planning</i> <i>Organising</i> <i>Keeping records</i> <i>Rehearsing and memorising</i> <i>Reviewing records</i> Reflection <i>Self-evaluating</i> <i>Self-monitoring</i> Collaboration <i>Seeking social assistance</i> Thinking <i>Metacognitive decision-making</i> Research <i>Seeking information</i> Affective skills Avoiding procrastination Being motivated Persevering Transfer	St-P-C St-P-O St-P-REF St-P-COL St-P-T St-P-RES St-P-A St-P-TR	
Behavioural control strategies (St-B)	Self-praise Self-criticism Self-reward Self-punishment	St-B-SPR St-B-SC St-B-SR St-B-SPU	
Environmental control strategies (St-E)	Help-seeking Avoiding/resisting distractions Environmental structuring	St-E-HS St-E-AD St-E-ES	
Learning difficulties (LD)	Low self-efficacy Surface processors of information Limited strategy use Inaccurate self-observation Inaccurate self-judgement Inaccurate self-reactions	LD-LSE LD-SP LD-LSU LD-ISO LD-ISJ LD-ISR	
Teaching students with LD (T-LD)	Individualised Education Plan Differentiation Accommodations Modifications Extended time Learning targets	T-LD-IEP T-LD-D T-LD-A T-LD-M T-LD-ET T-LD-LT	

Appendix B: Reflection Form

In an IB Diploma Programme in which teachers are learning to be more student-centred and explicitly teach ATL skills, how does the self-regulation of students involved in support or enrichment programmes evolve?

Do you have strategies or methods that help you complete your work and learn effectively in the IBDP? If possible, please select examples that that can show how you:

- go about managing your time management or staying organised
- go about revising for tests and exams
- go about writing essays
- go about research
- go about understanding what you read
- go about reflecting on your learning

If you do not have examples from all of the above categories, don't worry! Just select examples of any strategies or methods that show how you usually go about your learning. If you have six examples, great! If not, please select a minimum of four.

Sample 1: Please describe your strategy, and discuss why you chose to approach your learning in this way on this occasion. What were you hoping to accomplish? Did this strategy help? How do you know?

Sample 2: Please describe your strategy, and discuss why you chose to approach your learning this way on this occasion. What were you hoping to accomplish? Did this strategy help? How do you know?

Sample 3: Please describe your strategy, and discuss why you choose to approach your learning this way on this occasion. What were you hoping to accomplish? Did this strategy help? How do you know?

Sample 4: Please describe your strategy, and discuss why you choose to approach your learning this way on this occasion. What were you hoping to accomplish? Did this strategy help? How do you know?

Sample 5: Please describe your strategy, and discuss why you choose to approach your learning this way on this occasion. What were you hoping to accomplish? Did this strategy help? How do you know?

Sample 6: Please describe your strategy, and discuss why you choose to approach your learning this way on this occasion. What were you hoping to accomplish? Did this strategy help? How do you know?

Appendix C: Interview Schedule

Preamble:

Thank you for agreeing to take part in this study. As you are aware, I am investigating how IBDP students in specialist programmes regulate their own learning and how they learn to do this. I would also like to understand what sorts of strategies, if any, you use while you are learning or completing your assignments and why you approach your learning in this way. Your answers to the questions I ask you, the examples you have brought with you, and the reflections you wrote, will give me a clearer picture of how you go about learning in the IB Diploma Programme, and why you go about it in the way that you do. To get started, of the examples you have brought with you, could you please select four to talk more about?

1. Tell me a little more about how you use this strategy or approach.
 - a. How/from whom did you learn this strategy/approach?
 - b. What do you do if this doesn't work for you?
 - c. Do you have any other strategies for *x*? How do you decide which to use in a particular situation?
 - d. What advice about *x* would you give to students just starting out in the IBDP?
 - e. Is there anything your teachers do/should do to help you with *x*?
2. In relation to the strategies we've just discussed, how well-prepared do you feel for the IB Diploma Programme/your IBDP exams? Why do you feel this way?
3. Have your Approaches to Learning changed at all since you started the Diploma Programme? Please explain.
4. What do you think makes good teaching?
 - a. *What are the characteristics or features of good teaching?*
 - b. *How could you recognise good teaching if you saw it?*
 - c. *How is 'good teaching' different from 'bad teaching'?*
5. What do you think are the habits of good learning?
 - a. *What are the characteristics or features of good learning?*
 - b. *How could you recognise good learning if you saw it?*
 - c. *How is 'effective learning' different from 'ineffective learning'?*
6. Is there anything else you can tell me that would help me understand how you approach your learning, why you approach learning in this way, and/or how you learned to do so?

Appendix D: Sample Summary Contact Form (excerpts of each section)

RBT Contact Summary Form

1. What were the main issues or themes that struck you in the interview?

Transcript of Economics script (demonstrates high levels of cognitive, metacognitive and epistemic awareness)

- Prefers to speak out her essays because they're so time-consuming to write
- Likes to have a conversation when she learns, as if she's explaining something to someone
- Had it printed up into a transcript so she can use it to revise

Annotated English text (demonstrates high levels of cognitive, metacognitive and epistemic awareness)

- Print out a past paper and attempt both the prose and the poem to see if she'd be able to respond to both in an exam situation as well as to develop the skills and challenge herself
- Gives herself 15 minutes because that's how much time she'd take during an exam
- Picks out key themes, ideas and literary devices
- *Grade 11 and my first IB exams, I think I can do this'*

Highlighted/annotated geography article (demonstrates high levels of cognitive, metacognitive, and epistemic awareness)

- Prints, highlights and annotates her articles, minimising the article a little so she can have a column on one side for her annotations
- Uses these to write essays and revise

2. Summarise the information you got (or failed to get) on each of the target questions you had during the interview

Question	Information
How has SRL developed	When she first started the IB she watched a lot of videos, but now she prefers past papers
SRL-enhancing teaching practices	Discussions which force her to think on her feet, discussing her own views and hearing other people's rather than just listening to a teacher and writing down what they're saying; 'I prefer to challenge myself to think because in the IB that's what you have to do'; having to think 'how am I going to approach this?' and Socratic dialogue work well
Habits of good learning	A growth mindset (says she started off with a fixed one) – focus on the process, not the grade, which she learned by improving in Spanish, reflecting on her learning and moving forward - she stopped focusing on the grades she was getting and started focusing on how she could achieve the grades she wanted.
Strategies	Highlighting and annotating, time management, revision, essay transcript
Perception of emphasis on student-centred, process-focused instruction and ATL skills	Don't focus on the grades at all at first – focus on the things you can do to improve (Since MYP we've focused so much on grades and numbers, we should focus now more on the process)

3. What struck you as you reviewed the work samples submitted by this participant?

- High levels of analysis in the highlighted/annotated geo article and English text
- Aims to make things as efficient as possible
- Keeps notes very simple yet they demonstrate high cognitive awareness
- Likes talking and has found a very creative way of building on this strength

4. What struck you as you reviewed the Reflections written by this participant?

- The developmental nature of her time management strategy as well as her focus on efficiency and self-motivation
- The geo article and English annotated text, too, reflect an emphasis on efficiency as well as on analysis and reflection – AA is all about learning, practising and accomplishing as much as possible in the shortest amount of time
- AA's econ transcript was a highly inventive strategy

5. Anything else that struck you as salient, interesting, illuminating or important in this contact?

Self-identified strengths	Self-identified limitations
Able to retain a lot of knowledge, apply and analyse Essay writing	Literary textual analysis is something she 'grapples with', so she practices it instead of essay writing
Researcher-identified strengths	Researcher-identified limitations
Efficiency Effort Reflection Strategy use Knows herself well as a learner Attitude Mindset	

Appendix E: Interview Within-Case Display (excerpts of each section)

- 1 – No influence and/or no evidence of SRL
 2 – Negative influence and/or evidence of maladaptive regulation
 3 – Somewhat positive influence and/or evidence of limited regulation (external and/or self-regulation)
 4 – Positive influence and/or consistent evidence of effective SRL

Intra-rater reliability check: _____
 holistic score: _____

Intra-rater reliability

What the student brings to the IB Diploma Programme					Intra-rater reliability score:
History	1	2	3	4	
Experiences	1	2	3	4	
Causal attributions	1	2	3	4	
Strengths	1	2	3	4	
Challenges	1	2	3	4	
Identity	1	2	3	4	
Interests	1	2	3	4	
Approaches to learning	1	2	3	4	
Epistemological beliefs	1	2	3	4	
Emotions	1	2	3	4	
Values	1	2	3	4	
Contextual influences					Intra-rater reliability score:
Teaching	1	2	3	4	
Explicit instruction of ATL skills	1	2	3	4	
IEP or FWP	1	2	3	4	
Strategy instruction	1	2	3	4	
Strategy-use monitoring	1	2	3	4	
Differentiation	1	2	3	4	
Self-regulated learning					Intra-rater reliability score:
Task analysis	1	2	3	4	
Goal-setting	1	2	3	4	
Self-efficacy	1	2	3	4	
Motivation	1	2	3	4	
Learning strategies	1	2	3	4	
Motivation strategies	1	2	3	4	
Metacognitive strategies	1	2	3	4	
Application of appropriate level of effort	1	2	3	4	
Monitoring learning	1	2	3	4	
Evaluating strategy use	1	2	3	4	
Persevere when strategy and effort are successful	1	2	3	4	
Change strategy as needed	1	2	3	4	

Appendix F: Reflection Sheet Within-Case Display

Intra-rater reliability check date: _____ Intra-rater reliability check holistic score: _____

Aspect of SRL	Demonstrates <i>limited</i> evidence (1)	Demonstrates <i>adequate</i> evidence (2)	Demonstrates <i>substantial</i> evidence (3)	Demonstrates <i>excellent</i> evidence (4)	Intra- rater reliability score:
Forethought (Zimmerman, 2000)					
Task analysis (Zimmerman, 2000)					
Personal goals (Zimmerman, 2000; Butler & Cartier, 2018)					
Planning (Zimmerman, 2000; Butler & Cartier, 2018)					
Visualisation (Zimmerman, 2000)					
Motivation and Beliefs (Zimmerman, 2000)					
Self-efficacy (Zimmerman, 2000)					
Outcome expectations (Zimmerman, 2000)					
Implicit theories of ability (Zimmerman, 2000)					
Stereotype awareness (Zimmerman, 2000?)					
Performance (Zimmerman, 2000)					
Enacting strategies (Zimmerman, 2000; Butler & Cartier, 2018)					
Self-monitoring/self-assessing (Zimmerman, 2000; Butler & Cartier, 2018)					
Of cognition/emotion (Zimmerman, 2000)					
Of task/environmental demands (Zimmerman, 2000)					
Of effort (Zimmerman, 2000)					
Reflection (Zimmerman, 2000)					
Adjusting (Butler & Cartier, 2018)					
Interpreting expectations (Butler & Cartier, 2018)					
Causal attribution (Zimmerman, 2000)					
Strategic review (Zimmerman, 2000)					
Self-reaction (Zimmerman, 2000)					
Rewards/sanctions (Zimmerman, 2000)					
Emotional response (Zimmerman, 2000)					
Revision of goals (Zimmerman, 2000)					

Appendix G: Work Samples Evaluation Sheet (original)

Work Samples Evaluation Sheet

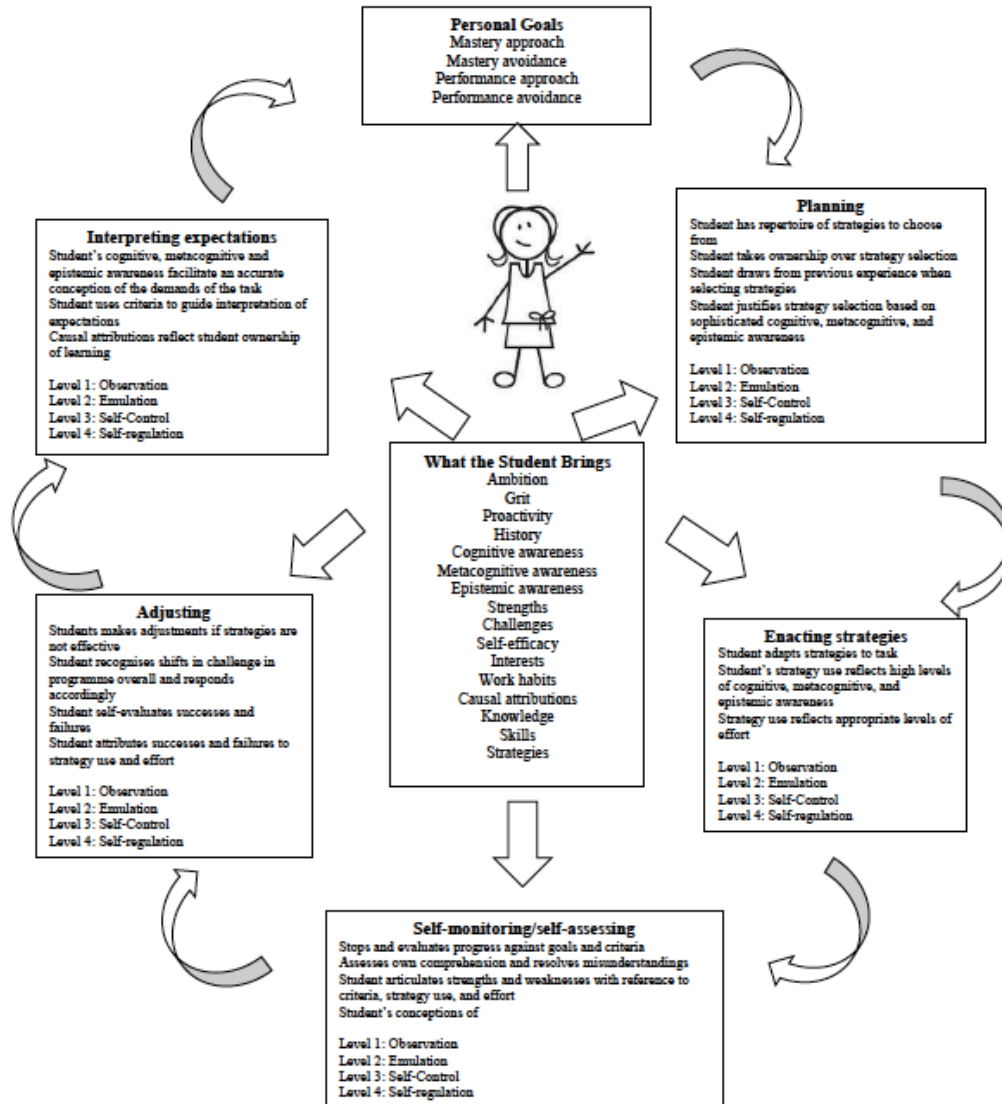
- 1 - Demonstrates **limited** implementation of target criteria
 2 – Demonstrates **adequate** implementation of target criteria
 3 – Demonstrates **substantial** implementation of target criteria
 4 – Demonstrates **excellent** implementation of target criteria

Intra-rater reliability check date: _ Intra-rater reliability check holistic score: _____

S: Searching for information that meets standards
M: Monitoring the degree to which information corresponds to standards
A: Assembling discrete bits of information by linking it to other information
R: Rehearsing information
T: Translating information into a new representation

Cognitive awareness						Intra-rater reliability score:
Strategy selected involves SMART cognitive processes (Winne, 2018)	N/A	1	2	3	4	
Strategy selected is appropriate for task, given either implicit or explicit learning goals	N/A	1	2	3	4	
Strategy use is specific to task at hand, and/or has been adapted as needed to the task (Pieschl <i>et al.</i> , 2012; Pieschl <i>et al.</i> , 2014a)	N/A	1	2	3	4	
Evidence of task complexity according to Bloom's taxonomy: remember, understand, apply, analyse, evaluate, create (Pieschl <i>et al.</i> , 2014a)	N/A	1	2	3	4	
Evidence of sound understanding in relation to subject-specific criteria	N/A	1	2	3	4	
Evidence of elaboration (Donker <i>et al.</i> , 2014): Student has reduced the number of words to ¼ or less of the original text	N/A	1	2	3	4	
Metacognitive awareness						Intra-rater reliability score:
Evidence of creation of 'desirable difficulties' (Bjork and Bjork, 2009) including varying conditions of practice, spacing study sessions, interleaving vs blocking, generation effect and testing effect	N/A	1	2	3	4	
Strategies unlikely to lead to 'illusions of competence' (McCabe, 2011) including dual code vs single code presentations, static vs animated media, relevant vs high interest details	N/A	1	2	3	4	
Demonstrates emphasis on standards of metacognitive monitoring: reliability of strategy, effort, pace of learning/task completion, confidence (Winne, 2018)	N/A	1	2	3	4	
Demonstrates awareness of strengths and weaknesses and what works for them (Winne, 2018)	N/A	1	2	3	4	
Epistemic awareness						Intra-rater reliability score:
Simple/surface (memorisation and rehearsal) vs complex/deep (elaboration and critical thinking) (Muis and Singh, 2018)	N/A	1	2	3	4	
Evidence of multiple standards for knowing (validation, justification, sourcing): How do I know this? Do I believe this? (Muis and Singh, 2018)	N/A	1	2	3	4	
Demonstrates an exploratory orientation and/or indicates awareness of uncertainty, ambiguity and or incoherence of complex knowledge (Flum and Kaplan, 2006)	N/A	1	2	3	4	
Demonstrates awareness of the variability (vs stability) of knowledge, in other words simple tasks may require surface strategies while complex tasks may require deep strategies (Pieschl <i>et al.</i> , 2014b)	N/A	1	2	3	4	
1: Demonstrates pre-reflexive thinking (if I believe it, it has to be true) 2/3: Demonstrates quasi-reflexive thinking (multiple perspectives) 4: Demonstrates reflexive thinking: (what kinds of reasoning and evidence support this) (King and Kitchener, 2004)	N/A	1	2	3	4	

Appendix H: Development of SRL Within-Case Display



Appendix I: School Reports Within-Case Display

Decision Rules:

1: The student demonstrates no or little self-regulation in most subjects. Where there are comments, most reflect poor effort and limited strategy use.

2: The student demonstrates some self-regulation. In at least some subjects, comments indicate some effort and attempts at strategy use, but support may still be required.

3: The student demonstrates good effort and independence with strategy use, but this may not always be effective or may be hindered by issues such as anxiety or perfectionism.

4: The student demonstrates advanced levels of self-regulation, characterised by appropriate levels of effort and effective use of strategies.

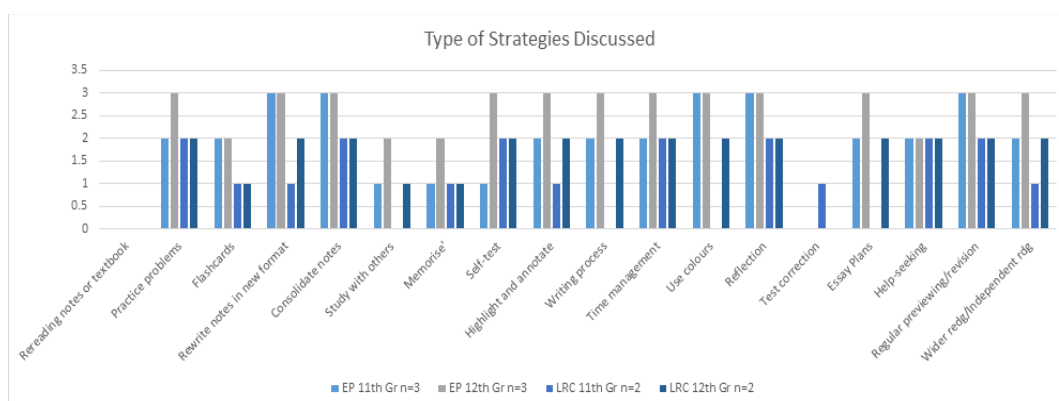
	1	2	3	4
June 2015 (SR)				
October 2015 (PR)				
December 2015 (SR)				
April 2016 (PR)				
June 2016 (SR)				
October 2016 (PR)				
December 2016 (SR)				
April 2017 (PR)				
June 2017 (SR)				
October 2017 (PR)				
December 2017 (SR)				
April 2018 (SR/PR)				

Appendix J: What the Student Brings Across-Case Pattern Display

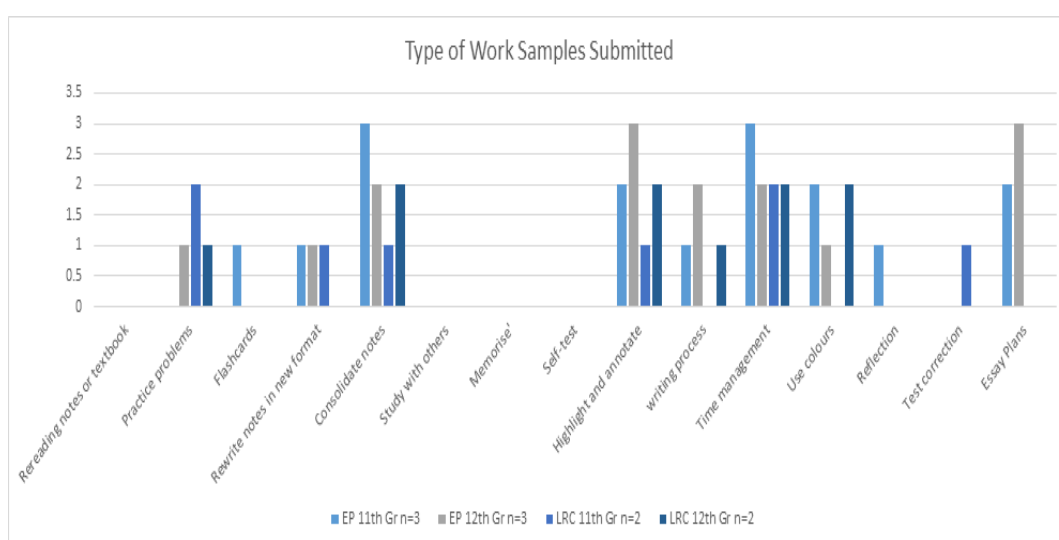
What the Student Brings Across-Case Pattern Display

Rating	Interest	Boredom	Self-efficacy/ Confidence	Prior knowledge/ strategies	Causal Attributions	Strengths	Grit	Proactivity/ engagement	Anxiety/ Perfectionism	Effort	Procrastination	Ambition
1 (no statements indicating quality influences SRL)												
2 (1-3 statements indicating quality influences SRL)												
3 (4-5 statements indicating quality influences SRL, or statements indicate recent shift))											
4 (consistent (6+) statements, or particular statements strongly indicate quality influences SRL)												

Appendix K: Type of Strategies Described Across-Case Pattern Display



Appendix L: Type of Strategies Submitted Across-Case Pattern Display



Strategies from left to right:

Rereading textbook or notes
 Practice problems
 Flashcards
 Rewrite notes in new format
 Consolidate notes
 Study with others
 Memorise
 Self-test
 Highlight and annotate
 Writing process
 Time management
 Use colours
 Reflection
 Test corrections
 Essay plans
 Help-seeking
 Regular previewing/regular revision

**Appendix M: Cognitive, Metacognitive, and Epistemic Awareness Across-Case
Pattern Display**

Average Rating	Cognitive Awareness	Metacognitive Awareness	Epistemic Awareness
1			
1.25			
1.5			
1.75			
2			
2.25			
2.5			
2.75			
3			
3.25			
3.5			
3.75			
4			

Appendix N: Orientation Goals Across-Case Pattern Display

Primarily Mastery Approach	Primarily Mastery Avoidance
<p>OZ (clearly struggles with understanding but wants to get there; secondary orientation (equal balance) mixed performance)</p> <p>WSB: No history of strategy use, previously very poor time management and limited understanding of content, now weakly motivated with some evidence of a-motivation</p>	
Primarily Performance Approach	Primarily Performance Avoidance
<p>Piper (achievement-oriented with some emphasis on learning and on avoiding stress)</p> <p>WSB: Ambition, history of being able to coast, challenge of IBDP requires strategy use and student is beginning to adapt using some strategies she has been taught and others she has developed herself, strong evidence of reflection on learning and self-evaluation against criteria</p> <p>Karen (achievement-oriented with an emphasis on efficiency, with some evidence of MAP, distal goals and greatly valuing downtime)</p> <p>WSB: Ambition, history of being able to coast and to learn without teachers' instruction, challenge of IBDP has required some strategy use (Grade 11 Christmas exams somewhat of a wake-up call but not enough to make drastic changes, which she now regrets), minimal effort outside of class (except for IAs and internal exam preparation), student has increased effort in preparation for IBDP exams, using strategies she has developed herself, strong evidence of reflection on learning and self-evaluation against criteria</p> <p>Ally (achievement-oriented with an emphasis on efficiency and developing an effective process ('I have a growth mindset'))</p> <p>WSB: Ambition, highly strategic using strategies she has developed herself over a period of years based on her knowledge of her own strengths, weaknesses and preferences, strong evidence of reflection on learning and self-evaluation against criteria</p>	
Mixed Mastery and Performance Approach	Mixed Mastery and Performance Avoidance
<p>Chloe (heavy emphasis on memorising with understanding, with some evidence of PAV)</p> <p>WSB: Grit and proactivity, started academic career in a school for students with special needs, parents supported her ATL in the transition to secondary school, memory a strength so heavy emphasis on memorisation, despite advice from others regarding its downsides, brings high levels of effort and use of strategies she learned in LRC and prior to coming to MMI</p> <p>Eliza (equally achievement and understanding-oriented, with brief mention of distal goals)</p> <p>WSB: Ambition, came to MMI in Grade 9 with limited English, developed strategies to facilitate understanding and has honed those strategies over time, strong evidence of reflection on learning and self-evaluation against criteria</p> <p>Annabelle (equally achievement and understanding-oriented, with brief mention of distal goals and ambition)</p> <p>WSB: Ambition, history of being able to coast then taking two months at the start of each new academic level to adapt, challenge of IBDP requires strategy use (Christmas exams a wake-up call) and student is beginning to adapt using some strategies she was taught in Gr 9 PSE and the EP and others she has developed herself, strong evidence of reflection on learning and self-evaluation against criteria</p> <p>Samantha (equally achievement and understanding-oriented, with an emphasis on proactivity, efficiency, and environmental structuring, particularly help-seeking, to avoid stress and achieve to her potential)</p> <p>WSB: Grit and proactivity, multiple significant difficulties, family (previously) had low expectations but she has high expectations (insider knowledge), highly aware of strengths and weaknesses, has learned and developed strategies to build on strengths and compensate for weaknesses, exceptional levels of effort, strong evidence of reflection on learning and self-evaluation against criteria</p>	
Mixed Mastery (Approach and Avoidance)	Mixed Performance (Approach and Avoidance)
Mixed Goal Orientation	Limited evidence of goal-setting
<p>Sarah (PAP/MAP/PAV with some evidence of MAV)</p> <p>WSB: Ambition, external and internal pressure, perfectionism, procrastination anxiety, extraordinary effort, task structuring and elaborate time management strategies to help manage stress levels and facilitate high achievement, lack of efficiency, strong evidence of reflection on learning and self-evaluation against criteria</p>	

Appendix O: Development of SRL Across-Case Pattern Display



Appendix P: The Preferred Teaching Approaches and Strategies Across-Case Pattern Display

Teaching strategy	Gifted 11 th graders	Gifted 12 th graders	11 th graders w/ LD	12 th graders w/ LD
Collaborative learning				
Modelling				
Coaching				
Scaffolding				
Fading				
Process focus				
Structured inquiry				
PBL				
Direct instruction				
Diagnostic assessment				
Formative assessment				
Open-ended assessment				
Providing criteria				
Explaining criteria				
Differentiation				
Flexible grouping				
Extension				
Enrichment				
Acceleration				
Accommodations				
Modifications				
Pacing				
Clarity of instructions				
Workload				
Type of task				
Level of challenge				

Appendix Q: Focus Group Schedule

Preamble: Thanks a lot for agreeing to participate in this focus group. As you are aware, I am using focus groups to help me understand what you think is good teaching, to consider how this compares to what teachers think is good teaching, and to determine which perspective is more aligned with the IB's understanding of good Diploma level teaching. With this in mind, it's important for you to be as honest as possible. Anything that is said within the context of this focus group must be considered strictly confidential by all members. Also, focus groups are quite different from interviews. My plan is to speak as little as possible. I will start by asking you a question and I want you to discuss this question with each other, not with me – try to pretend I'm not here.

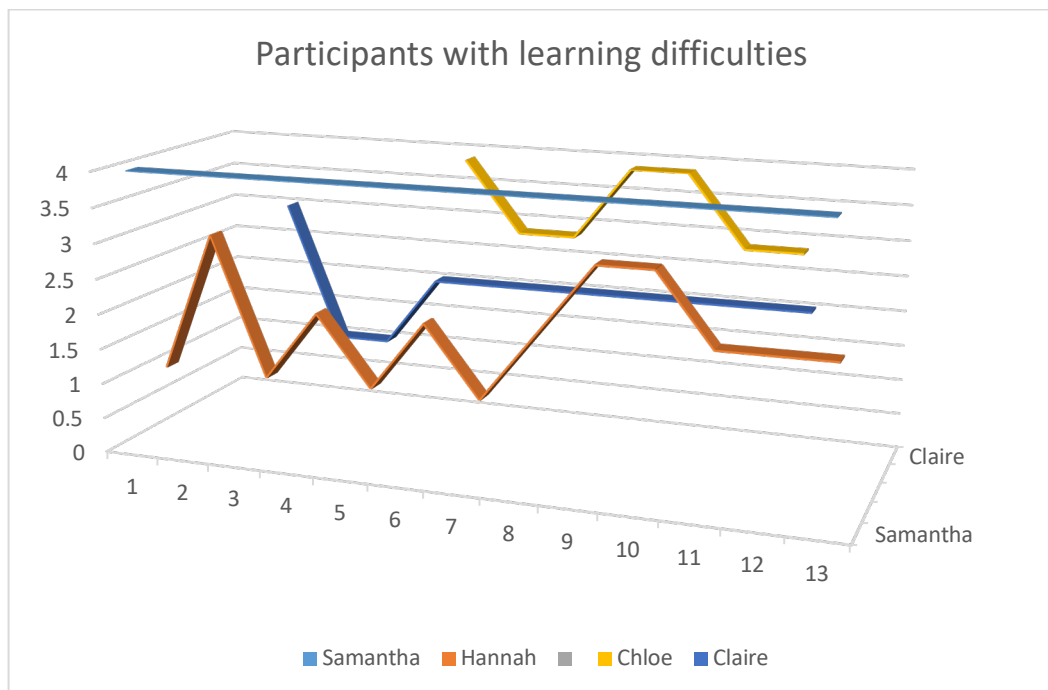
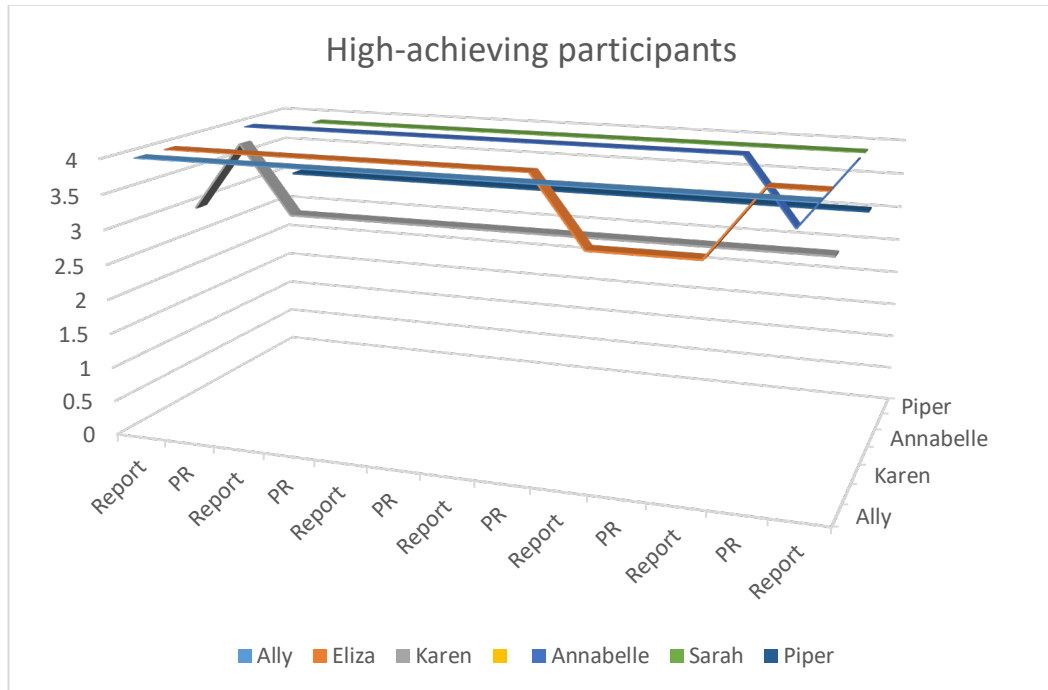
RBT Focus group questions

1. How do your teachers help you learn research skills (finding, interpreting, judging and creating information)? How important is it for teachers to teach IBDP students how to research effectively?
2. How do your teachers help you learn thinking skills (analysing and evaluating issues and ideas, generating new ideas, and considering new perspectives)? How important is it for teachers to teach IBDP students how to think critically and creatively?
3. How do your teachers help you learn organisation skills (managing time and tasks effectively)? How important is it for teachers to teach IBDP students organisation skills?
4. How do your teachers help you learn affective skills (managing state of mind)? How important is it for teachers to teach IBDP students affective skills?
5. How do your teachers help you learn communication skills (exchanging thoughts, messages, and information effectively through interaction, and reading, writing, and using language to gather and communicate information)? How important is it for teachers to teach students how to communicate effectively?
6. How do your teachers help you learn collaboration skills (working effectively with others)? How important is it for teachers to teach IBDP students how to collaborate effectively?
7. How do your teachers help you learn reflection skills (considering and reconsidering the process of learning, choosing, and using ATL skills)? How important is it for teachers to teach students how to reflect effectively?

Appendix R: The Importance of Teaching ATL Across-Case Pattern Display

ATL Skill	EP 11 th graders	LRC 11 th graders	LRC 12 th graders
Communication	+	+	+
Collaboration	+	—	—
Thinking	+	+	+
Reflection	+	+	+
Research	+	+	+
Affective skills	+	+	+
Organisation	—	+	+

Appendix S: School Reports Across-Case Pattern Displays



Appendix T: Worked example of coded interview transcript

Exceptionally high levels of
cognitive, metacognitive, and
epistemic awareness.

AA Grade 12

April 27,
2018

Thank you for agreeing to take part in this study. As you are aware I am investigating how IB Diploma students in specialist programmes regulate their own learning and how they learn to do this. I would also like to understand what sorts of strategies, if any, you use while you are learning or completing your assignments and why you approach your learning in this way. Your answers to the questions I ask you, the examples you have brought with you and the reflections you will write will give me a clear picture of how you go about learning in the IB Diploma programme and why you go about it in the way that you do. To get started of the examples you've brought in with you let's just do 4 in the interest of time. I'll keep all of them but why don't you pick 4 that you feel like really reflect best how you go about learning.

I use these ones for time management so I'll do that as well.

Excellent, which one do you want to talk about first?

I suppose this one's quite interesting to talk about.

Okay so tell me what this is?

It's a transcript of a recording I did when I was revising for my economics mock. So what I usually do when I revise, because I don't actually like to write essays a lot of the time when I'm practising for exams because I feel like it's so time-consuming. So what I do is I'll have a question and then with my phone I do the dictation option on the keyboard so I'll just speak into my phone and I just talk as if I'm answering the question because I'm also the kind of person who, when I learn, I like to have a conversation as if I'm explaining something to someone. So what I did was I had a question, so, should garments have laws preventing oligopolies? And then I just spoke into my phone and I answered it as if it was an essay and then what I can do now is when I'm actually revising for that I can go over this as well and look at the transcript.

That's such a good idea. Does it work well? Does it type out what you're saying pretty well or do you have to spend a lot of time fixing it?

Well yes, it generally works quite well, it's just last night when I was looking over it, because I actually hadn't looked at it after the exam, there were a few typos so I just corrected them but it only takes 5 minutes. So I think it's quite effective.

Yes, that sounds like a good strategy. How did you learn that strategy? How did you come up with that?

Well, I always knew that I'm the kind of person who can talk a lot. So what I used to do when I was younger maybe like grade 6,7,8 even, what I'd do is I'd have my book which I was revising from and I'd look at the question and then I'd walk around my house as if I'm explaining it to someone. Or sometimes I'd literally go up to Mum and I'd say, did you know this? And I'd start telling her loads of facts, so I knew that this was a method which actually worked for me and I thought when I actually do something where I can record it and actually have my response in writing as well so then if I need it in the long term I can use it so that's quite useful for the IB because it's over 2 years.

That's really cool. And it's lucky that technology on the phones has, because it didn't used to be very accurate, it used to be kind of a mess. Whereas it's good to know that

A real understanding of what the
IB entails, and of the need to adapt
accordingly.

ST-L-Ref

PAP

ST-L-Ref

ST-L-Ref

PAP

PAP

MAP

PAV

MAV

(29)

(9)

Ø

Ø

reliance upon criteria to master skills etc.

Mastery Other by Performance

ST-L-AT

P-SRL-Ref

Met-EF

P-SRL-Met

IN

P-SRL-Met

P-SRL-ST

P-SRL-H

ST-E-HS

P-SRL-Met-EF

P-SRL-CA